GAS JOURNAL

LIGHT ✂ HEAT ✂ POWER ✂ BYE-PRODUCTS

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Editorial Notes.

Legality of a Service Charge for Gas in U.S.

A DECREE of the United States Court for the Western District of New York has given legal endorsement to the principle of a proper allocation of costs in constructing gas consumers' rates; in fact, as we interpret the ruling, failure to make proper allocation constitutes an illegality, inasmuch as, if supply is given to one consumer without his paying his fair share of the costs of the service, the supplying company is involved in loss, and other consumers have to pay more than their proportion to compensate the loss. Such a condition cannot be legally defended. A résumé is published in later columns of the case in which the Public Service Commission of the State of New York, the Niagara Falls Gas and Electric Company, and others were concerned, and of the opinion of Judge Hazell, upon which the confirming decree of the Court has been given. It appears that the Public Service Commission have, acting under certain laws of the State of New York, been refusing to allow the Niagara Falls Company the right to impose a service charge or any charge other than "a fair and reasonable price for the gas actually supplied," which has meant the continuance of a flat rate. The Court has now held that the laws of the State of New York that were in question are "in contravention of Article 1, section 10, sub-division 1, of the Federal Constitution, and the Fourteenth Amendment thereto." We know nothing about the Article, the section, the sub-division, or the amendment; and therefore can, without hesitation, rely upon the ruling of the Court. When the decree departs from the legal to practical points, there is complete appreciation. It recognizes that, where there is not an equitable allocation of the cost of service to each consumer, some must pay in excess for the volume of gas they take to enable the Gas Company to recoup the loss occasioned by consumers who do not take sufficient gas to reimburse the Company for the service cost. In either event, the property of consumers or of the Company is being taken in violation of the guarantee of the Federal Constitution. Thus an injunction has been issued which directs the Public Service Commission not to impose any order which requires the service of a specified or fixed volume of gas for a specified sum, which does not equitably allocate: (1) A part thereof, including an equitable part of a fair return, to each consumer to compensate the Company for those services which are rendered alike to all consumers; (2) to compensate the Company for those costs, including an equitable part of a fair return, imposed by each consumer upon the Company, according to, and by reason of, his particular demand for service. Finally, an injunction against the Company restrains them from charging any consumers a rate for gas service in excess of its fair and reasonable value to enable them to recoup losses sustained by reason of their service to other consumers. From this it will be seen the Court condemns flat charges for gas, and confirms the propriety of a rate structure which includes the element of a service charge. The decision, we believe, will break down what has been the main obstacle to a wider adoption than has already been the case in the United States of a tariff which has justice and common sense to support it, and is an inducement to a greater beneficial use of the gas service.

A Plea for a Co-operative Policy in Australia.

WE strongly commend for its intrinsic interest the Presidential Address of Mr. Andrew Wilson, M.Inst.C.E., General Manager of the Australian Gas Light Company, to the Australian Gas Institute. It is a clear call to the gas undertakings in far-away Australia to concentrate largely on policy in respect of trading, and that at once. It is significant that an engineer of such eminence in the Australian gas industry should have avoided engineering and manufacturing topics for the purpose of solely raising matters affecting gas trading policy. The fact shows what, for the time being, is to his mind of primary importance to Australian gas interests. From what we read, he is not mistaken; and if the address eventuates in the formulation of a broad co-operative policy which will be actively pursued, then his survey and counsel will not have been in vain.

In making examination of the gas-trading position, he notes the weak points in the lines of gas defence, and considers how best to strengthen them. That is an excellent exercise not only for an industry in its collective state, but for its constituent units. If there was more introspection in the light of changing circumstances, there would be less supineness, more revision of policy, and greater activity, with beneficial result. The first impression the President got in making his survey is that visibility is poor, due to the agitation of the Australian atmosphere by a myriad of electrical discharges of a propaganda nature. In the Press and through all other means of publicity, the people have electricity thrust prominently before them; and is it to be wondered at, with that condition insufficiently countered by the gas industry, that many people get possessed of the idea that electricity is the coming thing, and that gas is gradually departing from this life? If correction of the error is left to the individual experience of consumers, the process must be a slow one, and one which will not make the individual any the more pleased because he has had to pay dearly for the experience without adequate warning by the gas industry. Electrical advertising method is much the same in Australia as in this country. People are told of the wonderful things electricity can do, but the information does not include any mention of sluggish operation in heating, and the wonderful bill which electricity manages to build-up by its use for that purpose. The omission should be

rectified by the gas industry. There is nothing *infra dig.* in telling the truth; it is, in our opinion, a breach of trust not to do so when it is in the interests of the public, and in those of the gas industry. In 1926, in Sydney consumers were getting 8353 B.Th.U. for every penny spent on gas, and only 1896 B.Th.U. for every penny expended on electricity—not one-fourth the potential heat value for money. The President puts the question, Should we not broadcast this? "Certainly" is the only answer we can find. An experience which is a somewhat common one is quoted by Mr. Wilson in relation to Sydney. While the consumption of gas in that city increased between 1920 and 1926 from 29 million therms to 35½ million therms, the annual consumption per consumer declined from 179 to 166 therms. This the President considers must be attributed directly to the encroachment of electricity on the lighting load. In this country, we have found that the incoming of the prepayment consumer had a more marked effect in depressing the average; but we have long since passed from the bottom of the curve, and have almost again reached the peak of averages, including the prepayment consumers in the calculation. This is due to the development of the individual consumer's use of gas, which is most profitable business. There is a reflection of the effect of the incoming of small consumers in the electricity experiences of Sydney. In the same period—1920-26—the annual consumption of electricity increased from 3·75 million to 8 million therms; but the annual consumption per consumer decreased from 68 to 51 therms—a decline of 25 p.ct., compared with 7·2 p.ct. in the case of the average gas consumption. The big drop in the electricity average, Mr. Wilson says, is owing to the inclusion of a great number of unprofitable consumers, whose business has been secured at considerable expense. Loss has been incurred, and the unfortunate ratepayers—including the Gas Company and their customers—have had to supply compensation.

At the meeting, the members had before them a report by a Committee on the best means of combatting electrical competition. We shall hope to have a copy of this document, as there is sure to be much interest in it. Of immediate concern is the broad policy that the President wisely advises. He desires co-operative propaganda work; closer touch with architects and builders; the framing of model regulations for the installation of gas, and for the undertakings in each State to endeavour to have them adopted and made enforceable; and the installation of appliances which comply with definite standards of efficiency and safety. The New South Wales Commercial Gas Association have taken steps to institute such standards along the lines adopted by the American Gas Association, and with very promising results. This all leads up to the recommendation by Mr. Wilson that an Australian Commercial Gas Association should be formed. It is clear the scope for the activities of such an organization is immense; of the inestimable effects there can be no doubt. We know the value of our own "B.C.G.A.;" and we are cognizant of the power of such a centralized organization in quarters where the individual gas undertaking has no effective means of penetrating. There are other proposals in the address in regard to which co-operative effort should be exercised. What the President is out for is a trading policy for the Australian gas industry commensurate with, and abreast of, the conditions of the times, and not the maintenance of a policy which could only apply to the days that have passed, and is now effete. We hope the news will not be long coming that his ambitions, which are founded on common sense, have been wholly fulfilled.

Retrograde Builders of Canberra.

IN this country we have had experience of certain municipal authorities who administer electricity undertakings doing their best to prevent essential gas from becoming a competitor of electricity on their housing estates. These are cases in which municipal ownership runs counter to public interests; but this is a small matter compared with the extreme partisanship which is responsible for the decree that the Federal Capital City of Australia—Canberra—shall be all-electric, and that gas shall not be allowed *entrée* to it. Such a condition in these times for a brand-new city is a matter against which there should be no uncertain protest on the part of the public, as well as on that of the gas industry—protest based on the soundest of economic grounds. The only reason advanced for the prohibition of gas is that electricity could not for years stand competition with it. Poor electricity! The gas industry would not shrink from the competition of electricity in the city, nor try to prevent its presence there. Without the service of gas, Canberra will be one of the most out-of-date cities in the world; for people who cannot afford electric heating will have, through the absence of gas, to use smoke-producing coal. That is not a condition which should obtain there. To make no provision for the service of gas is not progress; it is retrogression. It also means that the inhabitants are to be heavily taxed through electricity—solely in its interests, and not their own. If the powers that be had prohibited coal and provided for the service of gas, we should have seen sanity in the decision. But as it is——well, we hope there will be reconsideration of the matter, and revocation of the foolish decision. If not, then, in the interests of the city and its inhabitants, the voice of the public should be heard in a very distinct and definite manner. The matter is referred to in Mr. Andrew Wilson's Presidential Address, to which attention is directed in the preceding article.

Low-Temperature Expectations.

OPTIMISM and confidence are excellent qualities in business. Both had prominence in the address which Sir Arthur Wheeler, Bart., delivered at the recent meeting of Low-Temperature Carbonisation, Ltd. After reading it, we sincerely hope the Company have at length reached the goal for which they and their predecessors have been searching for a generation or more, and which search has been marked and marred by a colossal expenditure and untold disappointment. Nevertheless, the stages in the history have been many at which proclamation of success has been made. It is made again to-day. The shareholders will hope that dividends will give a much-needed confirmation.

Not much appears in the long address of Sir Arthur upon which to make judgment as to the soundness of his statements and predictions. It was an address probably satisfactory for the ears of shareholders, but not for the eyes of technical men. However, it is again declared that, "for the first time," the Company's process is completely successful from both the technical and the commercial standpoints, and that independent experts have given it as their opinion that the works are a long way ahead of the efforts of any other group engaged on the development of a low-temperature process. "For the first time" is not complimentary to those who have previously asserted the same thing. Over and over again, it has been pointed out that a low-temperature carbonization process may be technically successful, and yet not commercially. In every line of products, commercial success is dependent on markets which are extraordinarily fickle. "Coalite" being the primary product, it will have to bear the differences in revenue brought about by the downward fluctuations of the other products—such as oils and sulphate—while being itself in open competition with other fuels the prices of which are anything but stable. It must not be overlooked, too, that since the advent of the "Coalite" system, much new knowledge has been acquired, which has convinced fuel technologists that the mere leaving of a little extra volatile matter in coke is not at all necessary to obtaining a good ignitible and combustible coke if its physical structure is right; and ways and means of securing improvement in this respect are within the bounds of present-day information. This expansion of knowledge from research has not been to the advantage of the commercial prospects of coke containing a little extra volatile matter, which, if it can be dispensed with by the coke, is useful for other profitable purposes. There is really nothing in the way of data in the address, or at all events in the reports of it which we have seen, to help us to a more intimate acquaintance with the grounds for Sir Arthur's confidence in respect of commercial success. Then, again, he does not supply the names of the inde-

pendent experts who have given it as their opinion that the Company's plant is a long way ahead of the efforts of any other group. Therefore, we cannot place much weight upon his general statement—more especially as we are familiar with carbonizing and chemical experts who have made much the same remark concerning other low-temperature processes. The best proof of all will be future working results.

Regarding "Coalite" as a fuel, we have no criticism to offer of the declaration that it gives an intensely hot fire. All solid fuels containing a high precentage of pure carbon will do that on being made incandescent. The Chairman of Low-Temperature Carbonisation, Ltd., must not overlook the fact that no fuel can emit more heat than it contains, and the actual radiant efficiency in using low-temperature coke is from 30 p.ct. to 34 p.ct. It is true that such fuel will contribute, as does gas and gas-works coke, to the abatement of the smoke nuisance—if consumers can be induced to buy it when genuinely in competition with other fuels, and at a price at which it can profitably be sold. But the experience so far is of such modest order that it cannot be said demand has had a fair trial; and it is not likely to for years to come, unless many of the other systems also come into operation, and contribute to the supply. The Company's Barugh plant, for instance, has only a coal-input capacity of 90,000 tons, and the Askern plant (which, it is stated, will be erected this year) will have an input capacity of 180,000 tons—the yield of "Coalite" from the two plants when in full work will be only 180,000 tons, or about 0·45 p.ct. of the domestic coal consumption of the country.

Reverting to the question of the quality of "Coalite," it will be a pity if, for public purposes, there is an over-statement of claim. We read: "There is no other plant "in the country, and we know of none anywhere else, "in which smokeless fuel ready for the fire drops from "the retorts—fuel which can be lighted in the same way "as coal, which possesses exactly the right proportion "of volatile constituents, which has a greater heat value "than coal, and which yields all the advantages of a "super-coal fire, without any of the disadvantages, and "at less cost." Sir Arthur's knowledge of what is being done is manifestly incomplete. Size of coke depends upon the chemical and physical characteristics of the coal used, and the space within which it is carbonized; the volatile content of the coke depends upon the temperature to which the coal charge is subjected. And temperature in any low-temperature system is something which can be regulated to requirement. We have had in this office coke from another low-temperature process which has done all Sir Arthur says "Coalite" will do; we have seen coke from still another low-temperature system which has ignited by pieces of newspaper, and gave a beautifully incandescent fire. The fuel was used exactly as it dropped from the retorts. Thus, we would urge Low-Temperature Carbonisation, Ltd., not to overdo their claims, or to regard their particular design of low-temperature plant as being superlative in merit among the "pebbles on the beach." There is no individual property in the use of low temperature in carbonization; there can only be property in the particular means of application; and the means of application, of course, contribute to the degree of efficiency and the qualitative results.

Visions of a golden harvest will no doubt have been engendered by the allusion of Sir Arthur to a big scheme which is the subject of conversation or negotiation, whereby a ring of collieries in England and Wales will—if the plans mature—adopt the Company's plant, and make "Coalite" to their specification. The capital involved will probably be from 5 to 10 millions sterling, between which figures there is a wide margin, which suggests that nothing definite is yet on the table. There will be interest in learning of any developments of this project. But before this meeting, news had reached us of other low-temperature interests being in negotiation with colliery concerns for the installation of plants—maybe not the same collieries as those to which Sir Arthur referred. Colliery owners who desire to indulge in low-temperature carbonization may be relied upon to ensure that, when branching-out into a new business, they will get the best plant available. They may even be tempted to await the results of the trial which is to be made for the Government by the Gas Light and Coke Company, and with a design of plant for which the Fuel Research Station is responsible.

Caking of Sulphate of Ammonia.

WE hope that, with the claims of Christmas and New Year festivities, the article on the above subject (published in the "JOURNAL" last week) by Mr. W. G. Adam, Superintendent of the Gas Light and Coke Company's Tar and Ammonia Products Works at Beckton, will not have been overlooked. It deals with an important problem affecting the commercial interests of sulphate of ammonia—a problem which has been engaging investigators for some time past, and to the solution of which the Beckton Products Works has made valuable contribution. Various workers have come to the conclusion that size of crystal has a bearing upon what Mr. Adam describes as the "cakeability" of sulphate of ammonia; and reasons have been given for their belief. The Beckton researches show that immunity from caking is not guaranteed by the production of a large crystal, neither is trouble to be anticipated purely on the ground of the crystal being small. But a true indication of the "cakeability" is the percentage of voids, on which size and grading of the crystal have practically no bearing. As seen from the article, the manner in which the tests were made which determined this is very ingenious. The voids percentage depends largely upon the shape of the crystal; and so makers are advised to produce the long needle form, which gives the greatest percentage of voids. It is interesting to learn that the synthetic product does not give a crystal which supplies a high percentage of voids. The crystals formed by the evaporation of sulphate solutions, as used in the synthetic process, have a low percentage of voids, and they evidently fit closely together—thus giving a sulphate which cakes readily. This is a point in favour of bye-product sulphate. The difference in the forms of the crystals are well illustrated by the microphotographs that were given by Mr. Adam (p. 33). The article and the curve supply full justification for the recommendation of the Sulphate of Ammonia Federation that moisture content should not exceed 0·2 p.ct.

The "Journal" Calendar.

We wish to thank the numerous subscribers who have written expressing appreciation of the "JOURNAL" Calendar and Directory for 1928. The contents, their value, and the convenient form of the book have received praise from many quarters. This is very gratifying.

Coal-Selling Schemes.

No further news has reached us respecting the progress of the Three Counties Scheme. As regards the South Wales Coal Marketing Association, the plans are not likely to be put into operation for a few weeks. There was a further meeting of the owners on the 5th inst., when it was arranged that particulars of the proposed grouping of collieries, classification of coals, and fixing of minimum prices should be issued to the colliery companies within a few days, and that a further meeting of the members should take place towards the end of the month. By that time the scheme "may be" completed.

Coke and Anthracite Values.

A correspondent of "The Times," whose knowledge of his subject was not quite up-to-date, recently asserted that ordinary household coal and anthracite were sold upon an equal thermal value basis. This, of course, was misleading; and correction was applied by Mr. E. W. L. Nicol, the expert of the London Coke Committee. He pointed out that the calorific value of good quality house coal should average 14,000 B.Th.U. per pound, and of high grade anthracite 15,000 B.Th.U. The current prices are 45s. 6d. and 76s. a ton respectively. Therefore, the B.Th.U. that 1d. will purchase are 57,000 and 37,000 respectively. Coke and anthracite are equally smokeless, and for most purposes, including open fires, are interchangeable

fuels. With gas coke averaging more than 12,000 B.Th.U. per pound, and at 36s. 8d. a ton—the present London price—it yields 61,000 B.Th.U. per 1d., or nearly 65 p.ct. more than anthracite.

The "Gas Salesman."

Varied contributions make up the pages of our supplement to-day. The Circle meetings include that of the London Area, at which Mr. J. G. Clark, of the Gas Light and Coke Company, read a paper which will be found to present in new light certain matters of current interest to those engaged in the sales of gas. The use of gas for refrigeration is coming to the fore; and it supplies an interesting part of Mr. Clark's contribution. In addition to the Editorial Notes and the Jottings, there is an article on "The Home of the Bachelor Woman" by "A Gas Saleswoman." "Gas for Steam-Raising" is among the miscellaneous items.

Testimony for Tar-Dressing.

Among our correspondence this week is a letter from Mr. G. Bertram Hartfree, who is an old angler and road engineer of many years' standing. He is Borough Surveyor and Engineer of Godalming, and has had a wide experience of gas-works tar, and the various imported surface dressings—in fact, he has, without bias, tried all materials advocated for road dressing. The result is that, in his opinion, ordinary gas-works tar, if properly dehydrated, is the most suitable material for road treatment. He counsels application in dry weather; if properly used, he has known it to penetrate the road surface a distance of 2¾ in. Such penetration must have a remarkable binding and preservative effect.

"Safety-First" Surfaces.

A "Special Correspondent" contributed an article to the "Glasgow Herald" for Jan. 3 on the subject of the slipperiness of modern roads. He admits that, where the right materials are used, including the chippings, it is possible to provide a road which is ideal from every standpoint, and non-skid. But he appears to be halting between two opinions as to whether prepared tar or bitumen is the better substance to use for the dressing; and we seem to detect in what he says a little bias against tar. He writes: "There has been a considerable outcry—and, it must be admitted, not without justification—concerning the use of tar upon modern roads, and because of the slippery surfaces that have resulted." Later on he says: "It may, of course, be stated that the use of bitumen as an alternative to tar may also make a slippery surface; but this is a statement which, in the interests of motorists and stockowners, ought to be subjected to some careful scrutiny." A great deal of evidence has been accumulated since the Slippery Road Surfaces Committee made inquiry, and a White Paper was issued which indicated that asphaltic or bituminous surfaces are less slippery than tarred ones. The evidence of to-day is distinctly against bitumen in respect of slipperiness. However, the "Special Correspondent" is of opinion that impartial evidence should be collected on the subject, with an account of the materials employed, and experiences regarding the chippings which are utilized. The life of chippings, he submits, is important; and whether they last longer with a tar or a bituminous dressing is one which it should not be beyond the power of science to determine.

Trade Union Membership.

The report of the Chief Registrar of Friendly Societies on trade unions during 1926—the year of the general strike and the prolonged mining stoppage—shows that there was a loss of 300,000 members, the heaviest expenditure in dispute pay ever incurred by trade unions, and a reduction of aggregate funds from £12,750,000 to £8,650,000. The average yearly contributions per member over all unions fell from 37s. 4d. to 35s. 10d., representing a total decrease of £250,000 in contributions. The average payment per member was expended to the extent of 17s. 8d. in unemployment, dispute, sick, accident, and other benefits; 14s. 1d. in management and organization; 1s. for federations and other unions; and 6d. in political activity. Therefore, out of 35s. 10d. per member, only 2s. 7d. remained to be added to funds. In 1920, the total membership of registered trade unions was nearly 7,000,000; but it has since fallen persistently, and in 1926 was 4,447,818.

Industrial Peace.

The first joint conference between representatives of the General Council of the Trade Union Congress and a prominent group of employers is to be held at Burlington House to-morrow afternoon. The representation at the conference will be good. The General Council have authority to speak on behalf of 4,000,000 trade unionists, while the 24 signatories to the letter received from the employers have interests in concerns responsible for a capital value of close upon a thousand millions. Included are Sir Alfred Mond, M.P., Sir David Milne-Watson, Lord Aberconway, Sir Herbert Austin, Lord Colwyn, Sir A. Dorman, Sir Robert Hadfield, Sir Hugo Hirst, the Marquis of Londonderry, Lord Weir, Sir W. Peter Rylands, and many other industrialists. The Sub-Committee appointed by the General Council of the "T.U.C." consist of Mr. Ben Turner (Chairman), Mr. W. Thorne, M.P., the Right Hon. J. H. Thomas, M.P., Mr. A. Pugh, Mr. E. Bevin, the Right Hon. T. Richards, and Mr. Walter Citrine (Secretary). It is earnestly hoped that as a result some machinery may be devised which will test how far common ground between the interests identified with industry can be reached. In their letter of invitation to conference, the employers stated: "We believe that the common interests which bind us are more powerful than the apparently divergent interests which seem to separate." Of course, it is not expected that the conference to-morrow will do anything more than open a discussion of the subjects which require exploration with a view to realizing the goal of collaboration for industrial progress.

Trade Unions and Co-Partnership.

Trade unions have hitherto regarded co-partnership schemes with strong suspicion. To that attitude Mr. Citrine, the Secretary of the General Council of the Trade Union Congress, referred at a recent luncheon of the Industrial Co-Partnership Association; and he expressed the view that now, if ever, is the time when that expedient could be given careful and impartial consideration. "There is," he said, "a spirit of inquiry abroad—a tendency to examine the facts of industry, a general disposition on the one side to appreciate the economic difficulties of the other, and a greater willingness on the part of the other to give access to information of a suitable kind." The conference of employers and representatives of the General Council will give a good opportunity to discuss the question of the closer alliance of labour with industry through co-partnership, which includes capital holding.

The Carbonization Conference.

As mentioned in last week's "JOURNAL," a Carbonization Conference will take place under the auspices of the Joint Fuel Committee of the Society of Chemical Industry, the Institution of Gas Engineers, the Coke Oven Managers' Association, and the Institute of Fuel from Tuesday, Feb. 21, to Friday, Feb. 24. The meetings will be held in the Midland Institute Lecture Theatre, Paradise Street, Birmingham, on Tuesday, Wednesday, and Thursday, and in the Queen's College, Paradise Street, on Friday. There will be morning and afternoon sessions on each day. Wednesday afternoon will be spent at the British Industries Fair; those attending the Conference being invited by the Management Committee of the Fair to take lunch there. On Thursday morning there will be a visit to the Birmingham Gas-Works. A large number of papers of outstanding interest will be discussed relating to carbonization; and papers delivered before the constituent societies during the past two years will be covered in the discussions. The processes of low-temperature carbonization will be fully discussed on Friday. No papers will be fully read; contributors giving a précis only. Full details will be published in the immediate future. Hotel accommodation is limited. All chemists and engineers interested in the subject of carbonization will be welcome at the conference, and application should be made for tickets and programmes to the Hon. Secretary, Joint Fuel Committee, Allington House, Victoria Street, S.W. 1.

PERSONAL.

Mr. JOHN HYDE, Assistant Gas Engineer and Manager to the Chesterfield Corporation, has been appointed Engineer, Manager, and Secretary to the East Grinstead Gas and Water Company, and takes up duties at the beginning of April. Mr. Hyde, who has been at Chesterfield for the last six years, previously held appointments with the Malvern Urban District Council, the Dudley Gas Company, and the Sedgley Urban District Council. During the war he served in the Royal Navy.

Mr. TERENCE HENDERSON MADDEN, on the completion of his pupilage, has been appointed by the Directors of the Cardiff Gas Light and Coke Company to the engineering staff of the Company, as Engineer Assistant.

The Greenock Corporation have appointed Mr. RONALD D. KEILLOR as Chief Assistant to Mr. George Keillor, the Gas Engineer and Manager. Mr. Ronald Keillor passed through the various departments of the undertaking after being apprenticed to engineering. He has been six years with the Department, and prior to the appointment was acting as Second Assistant.

Mr. LESLIE W. DUNN (son of Mr. Walter T. Dunn), of West's Gas Improvement Company, Ltd., has been appointed to the Engineering Staff of Messrs. Alexander Duckham & Co., Ltd., 6, Broad Street Place, London, E.C. 2. All gas undertakings in the Home and South Eastern Counties will be his special interest with regard to matters of lubrication.

The Minister of Health have appointed Mr. HERBERT GEORGE HOWSON, B.Sc., to be an Inspector under the Alkali, &c., Works Regulation Act, 1906. He has been assigned to the district with headquarters at Liverpool; Mr. W. A. DAMON, B.Sc., F.I.C., who was previously in that district, having been transferred to London in the place of Mr. F. N. Sutton, F.I.C., who has retired.

Mr. W. J. U. WOOLCOCK, C.B.E., has been appointed Chairman of the Managing Council of the British Road Tar Association.

Col. Sir EDWARD ALLEN BROTHERTON, Bart., left England on the 4th inst. for a visit to South America. He will be absent for three months, and correspondence will not be forwarded.

Under the transfer of the Knaresborough District Council's gas undertaking to the Harrogate Gas Company, which took effect from New Year's Day, Mr. HARRY WADSWORTH, Gas Manager to the Knaresborough Urban District Council, becomes Distribution Superintendent to the Harrogate Gas Company. At a luncheon to mark the formal handing over of the works, last week, Mr. Wadsworth was presented with a cabinet of cutlery on behalf of the Knaresborough District Council and the staff at the gas-works.

A pleasant function took place at the Coleraine Gas-Works recently, when Mr. J. TAYLOR, the late Manager, was presented with a beautiful marble clock suitably inscribed by the employees, on the occasion of his retirement. The company were entertained by Mr. Fred M'Elwee (the Engineer and Manager) and Mrs. M'Elwee at tea. Mr. Taylor, in returning thanks, referred to the loyal manner in which the men had stood by him during his term of office as Manager.

Mr. W. J. A. Butterfield, presiding at a meeting of the London Section of the Society of Chemical Industry on Jan. 2, made a presentation to Dr. G. W. MONIER-WILLIAMS, who a short time ago resigned from the Hon. Secretaryship of the Section. In handing to him a clock and an album containing the names of all those who had subscribed, Mr. Butterfield said that they were intended as an expression of gratitude on the part of the members for the ability and zeal with which Dr. Monier-Williams had conducted the business of the Section for seven very strenuous years. The spontaneity and fullness of the response by the members to the suggestion of making the presentation was an ample indication of their appreciation of what Dr. Monier-Williams had done for the Section. Dr. Monier-Williams, in acknowledging the gifts, said his work as Hon. Secretary had been more than repaid by the extreme interest of it and the cordial co-operation he had received from successive Chairmen, members of the Committee, and members of the Section. He would therefore regard the clock and album not so much as an acknowledgment of service which had already been amply repaid, but as a spontaneous expression of goodwill and regard from the members of the Section.

In the recent list of elections to Associate Membership of the Institution of Civil Engineers appears the name of Mr. H. S. BOYES, an assistant on the technical staff of the Harrogate Gas Company, under Mr. Frank H. Robinson, Assoc.M.Inst.C.E., Engineer and Manager.

A bonus of £50 has been granted to Mr. A. S. BROOK, the Gas Manager at Lisburn (Co. Antrim) for extra work performed by him under the roads reconstruction schemes.

Mr. H. CERCKEL, Manager of the Simplex Coke-Oven Company, who is leaving this Company shortly, is opening a consulting office on coke-oven work, coal washeries, &c., at Alfreton.

OBITUARY.

THOMAS HOLGATE.

As was briefly intimated in the last issue of the "JOURNAL," the death has occurred, at the age of 72 years, of Mr. Thomas Holgate, who was for a great number of years a prominent member of the gas profession. He was born at Burnley in 1856, and when quite young entered the service of the Corporation at the gas-works in that town. For fifteen years he remained at Burnley, where he received his training as a gas engineer under the then Manager, Mr. S. P. Leather. He resigned the position of principal assistant there, in order to take up that of Engineer and Manager of the Batley Corporation Gas-Works, in charge of which he spent some four years. It was at the end of 1888 that he obtained the appointment he was so long to retain of Engineer and Manager of the Halifax Corporation Gas-Works.

He was the author of a number of papers, articles, and addresses which proved of great assistance to his professional colleagues, and at the same time revealed the studiousness of his disposition. In quite early years the results of his experiments and researches concerning the relative merits of gas and steam motors were published; and in 1885 another contribution by him—this time on "Some Aspects of Destructive Distillation"—appeared in our pages. While at Halifax, he devised and patented a plant for the production of purified ammoniacal liquor, which formed the subject of a paper read by him before the Incorporated Institution of Gas Engineers in 1895—the title of this being "Purified Ammoniacal Liquor and its Use in Gas Purification."

Of this Institution he was President in 1902, when he delivered an address which, as remarked in the "JOURNAL" subsequently, was one of the most studious and comprehensive of the compositions which had of late been given to the gas industry from any Presidential Chair. He was the last President of the Institution as then constituted before the amalgamation of that organization with the old Gas Institute. During his year of office, the members of the Institution paid a visit to the Halifax Corporation Gas-Works, and saw the large and complete new section which he had constructed there, as well as the new chemical works. In the lamp making shop they saw a lantern fitted with an incandescent burner embodying, in a simple manner, many of the features which had been shown in his Inaugural Address to be valuable.

It was in the following year that, after nearly fifteen years' service in this capacity, he resigned the position of Engineer and Manager at Halifax, and announced his intention of opening an office in London and continuing professional work as a Consulting Engineer. He was a member of the Institution of Civil Engineers, a Fellow of the Chemical Society, and a member of the Society of Chemical Industry. The Council of the Institution of Civil Engineers awarded him a Telford Medal and premium, in 1897, for a paper on "The Enrichment of Coal Gas." After his retirement, he contributed many articles to the pages of the "JOURNAL"—the first of these, on "Gas Purification by Ammoniacal Liquor," appearing in August, 1904

LEON GASTER.

Illuminating engineering has suffered a great loss by the death on Saturday last, at his residence at Sydenham Hill, of Mr. Leon Gaster, after a short illness. He had, indeed, been associated with the movement since its commencement in this country, and was founder, as well as Hon. Secretary, of the Illuminating Engineering Society. In the gas industry he was widely known, and his death will be as widely regretted. When subjects of which he possessed special knowledge were under consideration, he frequently spoke at meetings; and his enthusiasm and obvious earnestness, combined with a ready wit, invariably secured the attention of his audience.

Mr. Gaster, who was 55 years of age, was born at Bucharest, where he was educated—taking in 1890 the degree of Bachelor of Science and Arts. Subsequently he went to Zurich, and later on moved to England, becoming a naturalized British subject in 1902. In the following year he commenced practice as a consulting engineer; and in 1908 he started the "Illuminating Engineer," of which he remained Editor up to the time of his death. A year later the Illuminating Engineering Society was founded by him, with the co-operation of a small band of enthusiasts; and of this body the "Illuminating Engineer" has all along acted as the official organ. At the meetings of the Society he was a regular attendant; and on many occasions he contributed papers to the proceedings. He also frequently lectured on various aspects of illumination before other bodies, and at numerous congresses and exhibitions—one being the National Gas Exhibiton of 1913. He was joint author of "Modern Illuminants and Illuminating Engineering." Numerous pamphlets were written by him; and on more than one occasion wireless listeners-in heard him discourse on lighting of the home, office, and factory.

In spite of all these activities, he found time almost yearly to make journeys abroad, taking part in a number of congresses, including the meetings of the International Illumination Commission in Berlin, Paris, and Geneva. He was a member of the National Illumination Commission of Great

Britain and of the Executive Committee of the International Illumination Commission, and British representative on the International Committees dealing with the lighting of schools and factories, as well as a member of several Sub-Committees established by the British Engineering Standards Association, dealing with lamps, fittings, &c. He was also a member of the Departmental (Home Office) Committee on the Lighting of Factories and Workshops, and a member of the Lighting Committee of the Home Office Industrial Museum. During the war he rendered service on Joint Committees set up by the Illuminating Engineering Society at the request of the Ministry of Munitions; and he acted as lighting expert to the Household Fuel Controller. He was a member of the Joint Committee formed by the Medical Officers of Schools Association to study "The Ideal Classroom," including lighting conditions; and he was an honorary member of the Association of Public Lighting Engineers, and a member of the Committee on Illumination working under the Department of Scientific and Industrial Research.

In addition to all these activities, Mr. Gaster was closely associated with the "Safety First" movement; and he was a Fellow of the Institute of Journalists, of the London District Committee of which he was for many years a member. During the war period he acted as Chairman of the Institute's Scientific, Trade, and Technical Circle, of which he subsequently became Hon. Secretary.

In recognition of his widespread scientific and journalistic achievements, Mr. Gaster was made a Commander of the Crown of Roumania.

Alderman RICHARD MANSFIELD died suddenly at his home at Plaistow last Sunday. He was closely associated with Mr. Will Thorne, M.P., in the formation of the Gas Workers' Union in 1889.

STEWARTS & LLOYDS, LTD.

Brief Review of the Firm's Activities.

At present there seems to be a widespread desire to compare the efficiencies of British industrial organizations with those of their rivals in the United States and Europe; and there appears, too, to be a bias in favour of the latter. Why should the notion exist that British undertakings are apt to lag behind in the march of progress? Perhaps the reason is to be found in the national trait of modesty where trade is concerned—a modesty which in these days of "advertise or perish" is of theoretical rather than practical value. This month Messrs. Stewarts & Lloyds, Ltd., whose Head Offices are in Glasgow, have published a book detailing recent developments in their works and recent activities in their endeavour to foster a real understanding between employer and employed; and the interest of this book, and the merit of the Company's aims, are sufficient justification for a brief article. What follows is evidence of the fact that British industrial organizations do realize their responsibilities fully.

CONTROL OF RAW MATERIALS.

The firm of Stewarts & Lloyds, who have always made a speciality of puddled wrought-iron tubes and fittings, and who execute their work in accordance with the recently issued specification of the Institution of Gas Engineers, are well known to the gas industry. The Company were formed in 1903, by the amalgamation of A. & J. Stewart & Menzies, Ltd., of Glasgow, and Lloyd & Lloyd, Ltd., of Birmingham. These firms had been in existence for over forty years, and at the date of their amalgamation were the two largest makers of iron and steel tubes in Great Britain. The policy of Stewarts & Lloyds has always been to control the supply of raw materials, to adopt the most modern and economical methods of manufacture, and to ensure an outlet for their products by a world-wide selling organization. They hold a substantial interest in the Wilsons & Clyde Coal Company, Ltd., who own collieries in Lanarkshire, Fifeshire, and Stirlingshire; and in England a supply of coal of good coking quality was ensured by the purchase, in 1923, of the Kilnhurst Collieries in the South Yorkshire coalfield. Supplies of iron ore and limestone are secured through the Company's subsidiaries—the North Lincolnshire Iron Company, Ltd., and Lloyds Ironstone Company, Ltd.—and by a joint interest in the Oxfordshire Ironstone Company.

In 1920 a controlling interest, since converted into complete ownership, was acquired in the undertaking of Alfred Hickman, Ltd., Bilston. The principal output of the North Lincolnshire Iron Company is basic pig iron for steel making; but foundry iron and forge iron are also produced—which constitute the products of the Hickman Company and Lloyds Ironstone Company. Brickmaking was commenced at the Kilnhurst Collieries in 1924; and the weekly output is now 120,000.

UP-TO-DATE WORKS.

The Clydesdale Iron and Steel Works, at Mossend, were among the properties owned by A. & J. Stewart & Menzies at the date of the amalgamation; and till 1924 they supplied most of the iron and steel for making lapwelded tubes, and practically all the steel plates for hydraulically welded tubes, required by the Scottish Tube Works. Re-organization of the plant, extending over a number of years, and including the installation of electric charging machines and mechanically fired gas producers, was completed in 1925 by the replacement of five rolling mills by a modern universal mill. This mill is the largest and most modern of its kind in Europe, and attracted much attention during a visit of the Scottish Junior Gas Association (Western District) to the works last November. It has a capacity of 5000 tons of universal plate per week, in widths up to 48 in.—an output nearly 50 p.ct. greater than the combined capacity of the five mills formerly in operation.

Similarly, large sums have been spent on the improvement of the Hickman properties since they were acquired; the most important addition to the plant being a continuous strip mill—believed to be the most efficient of its kind in Europe. The foregoing are two of the many improvements described in the book.

The manipulation of tubes into special shapes, and the provision of special joints, constitute an important branch of the firm's activities; and in 1926 the firm acquired a controlling interest in the Victaulic Company, Ltd.—the owners of the "Victaulic" joint patents.

WELFARE OF EMPLOYEES.

Stewarts & Lloyds have always taken a deep interest in the welfare of their employees. This interest has been shown in practical fashion by the provision of institutes and canteens; recreation grounds; housing schemes; "safety-first" schemes; schemes for assisting employees and their dependants in need of help as a result of sickness, old age, or other misfortunes; educational schemes; thrift clubs; and in various other ways. Six welfare supervisors are employed who devote their whole time to devising and carrying-out plans for the benefit of the employees and their families. In 1914 the Directors instituted a scheme for the payment of retiring allowances to employees who have grown old in the Company's service, or who have need of help to tide them over periods of financial difficulty arising from sickness or other causes. These payments are made from the Employees' Benefit Fund; and since the inception of the scheme, £207,132 has been paid to employees and their dependants.

In 1924 the Company introduced an employees' shareholding scheme based on the principle of equality of interest—*i.e.*, that the rights and privileges of the employee shareholders should be exactly the same as those of ordinary shareholders. Already 22,895 £1 shares have been paid for by, and transferred to, employee subscribers; the number being subscribed for at present being 51,518. To encourage employees to retain the shares, special bonuses are offered.

To promote a better understanding of the operations, aims, and responsibilities of the Company, a copy of the book from which the foregoing information has been drawn has been sent to every employee of the Company who has reached the age of 18.

Britain's Biggest Fair.—A practically complete catalogue of the London section of the British Industries Fair was issued this week, with six weeks still to go to the opening of the Fair on Feb. 20. This advance catalogue, which will be in the hands of trade buyers as far away as Buenos Aires before they leave for the Fair fortnight in England, contains the particulars of the exhibits of 1125 firms, with an index in nine languages. A booklet with it gives the names of the 700 exhibitors in the Birmingham section. The area actually occupied by the exhibitors' stands at the White City, Shepherds Bush, will be 250,000 sq. ft. Almost everything made in Great Britain, apart from the products of the "heavy" industries, which exhibit in Birmingham, will be shown. Taking both sections, the British Industries Fair will be the biggest yet held, and nearly twice as large as in 1926.

ELECTRICITY SUPPLY MEMORANDA.

READING the views of some leading electrical men as to the prospects of 1928 as published in "Electrical Industries," we are left uncertain whether or not they are satisfied with the outlook. Indeed, their minds seem to be somewhat troubled regarding what is really going to happen. It is all vague; and the Government scheme seems to be the influence responsible for their disturbed state. Of course, at that we cannot marvel; inasmuch as the greater part of the industry is about to enter upon a large fundamental reconstruction along altogether new lines, and with what is being done considerable discontent reigns. In the circumstances, men cannot be expected to voice positive opinions; and such as they do possess regarding the immediate future depends very much upon the angle from which they view the conditions before them. The happiest section of the industry appears to be the electrical plant and cable makers. One Director of an electrical manufacturing firm reflects the elation of the others when he writes: "The schemes now being prepared, or already sanctioned, by the Electricity Commissioners must result in large orders being placed for underground cables, overhead transmission lines, electrical machinery of all kinds, &c., which should benefit the electrical manufacturing industry in the coming and future years." The greater consideration is, Will the electricity supply industry really benefit by the new load of expenditure? The prospects of that section are not quite so certain as are those of the firms who will be given the huge orders for plant and the contracts for the constructional work.

Uncertainty and Satisfaction.

Municipal Resentment.

The past few weeks have seen numerous municipal owners of electricity undertakings which are roped into the South-Eastern scheme furious over the prospective scrapping of their stations. Nearly all of them wanted to be "selected," or, preferably, to be left alone. They do not like the proposed dismemberment now that it is brought a stage nearer, and they know that their cherished hope of being "selected" for continued existence has been shattered. They all profess that they have special qualifications and geographical suitability for the honoured position; that the Electricity Commissioners do not think so, matters little. We read in the electrical journals of the absolute confidence that reigns in the members of the Electricity Commission and those of the Central Board; we also read of the annoyance that the scheme has given to nearly all the administrators of municipal undertakings. The two statements appear to be lacking in compatibility. But that may be due to dullness of imagination on our part. The Commissioners are credited with great competence; but the widespread and open rebellion against their decisions suggests that everyone who has a grievance has made his own private estimate of the competence, although exercising a wonderful reserve in saying so. Acts, however, sometimes speak louder than words. Mr. F. W. Purse, the Borough Electrical Engineer of West Ham, confesses to difficulty, in existing circumstances, in visualizing the prospects for the New Year; but he does not find it difficult to hit out straight from the shoulder. He seems to think municipal enterprise is being sacrificed by the Commissioners on the altar of company enterprise. He does not like it; and he says so. This among other things is what he writes: "Never has the position been more apparent than to-day of the stranglehold being exercised on municipal enterprise for the betterment of company enterprise. In municipal circles confidence has been severely shaken, if not destroyed, by recent events; and it is far more necessary to restore this confidence than to strive after the last decimal point of efficiency—without the former, the latter will be of no avail in hastening forward the day of 'Electricity for All.'" Later he asks: "What municipal supply authority can look forward with equanimity to the future when they are uncertain where their supply will come from, and uncertain what the cost will be? The definite is to be replaced by the indefinite, the tangible by the intangible; and those who venture to raise their voice in protest are classed as heretics, and unbelievers are treated with scorn, ridicule and contempt." What the Central Electricity Board and the Electricity Commissioners have to say to this has not been made public. But it would be a pity if their methods of procedure earned for them the character and style of autocrats.

Regional Propaganda Developments.

The electricity industry, through its Electrical Development Association, has instituted Regional Circles in many parts of the country, and from them the name is derived for the present winter's Electrical Circle Campaign. The current year, we learn from the New Year's message of Mr. J. W. Beauchamp published in "Electrical Industries," is the ninth in the history of the central Association. The end of last year marked the close of Mr. Beauchamp's connection with it as Director, on the transfer of his services to Wales as the Chief Engineer of the Power Company operating in that part of the country. His successor, as we have already announced, is Lieut.-Col. Vignoles. Concerning the Electrical Circles, Mr. Beauchamp makes an interesting announcement. Those who administer the affairs of the Association, he says, are addressing themselves to the problem of a more complete decentralization which shall enrol the interest and secure to the central organization the help of local knowledge, while maintaining loyal support to, and an adequate representation for all districts on, the governing body. This indicates that experience so far has shown the value to the central body of subsidiary regional organization. But apparently Mr. Beauchamp sees a danger in it which he seeks to avert. He urges upon the many "earnest workers in electrical development all over the country not to endanger the unity of direction, which is of so much value in any enterprise of this kind, by strengthening local activities at the expense of the national effort." To do that would be a pity; there should always be filial loyalty to the parent body. It is true the local developments have grown out of the central organization; and many more can do so. The Association has, as Mr. Beauchamp says, "been at once their inspiration and the foundation upon which their work has been built." Of the value of such territorial auxiliaries to the central organization, and to the regions themselves, there can be no manner of doubt.

Advice to the Electricity Industry.

It will be remembered that in his Presidential Address to the Institution of Electrical Engineers, Mr. Archibald Page, the Chief Engineer of the Central Electricity Board, impressed upon the electricity industry that there is one thing essential to make a success of the great scheme of electricity generation and transmission about the country. In their annual report, the Electricity Commissioners, while not saying precisely the same thing, speak of the need for adequate facilities for organized propaganda and research, if full advantage is to be taken of the opportunities for further expansion and technical improvement which continually present themselves. In this connection, the Commissioners remark: "It is for the industry to ensure that there is no curtailment of useful effort in these directions through lack of financial support, and that the machinery at its disposal for propaganda and research is commensurate and efficiently maintained." We commend those words to the consideration of the gas industry—first, in the light of their application to the electricity industry, and, secondly, in that of their application to itself.

The Commissioners and Their Work.

The Electricity Commissioners cannot help their existence. They were brought to life by legislation; by the same process their functions were more or less defined. They are not responsible for the complex nature of their duties. Their annual report deals with such a mass of detail that there can be no denial that they are a hard-working body, who have the interests of the industry at heart. An acknowledgment to this effect was made by "Engineering" in a comment on the Commissioners' report; and it adds: "Their duties are performed conscientiously; but the faint doubt arises whether many of them need be performed at all." There are many in the electricity industry who appear to-day to be in profound agreement with this view. Our contemporary condemns a system which surrounds the industry "by a cloud of applications, orders, consents, sanctions, and arrangements." It urges simplification; adding "to achieve this simplification may be an impossible ideal, but it is one which it is worth while striving to approach." We are afraid that approach can only be made through those long and winding avenues provided by Parliamentary procedure. We pause. Do the Commissioners themselves want simplification? If it took place, it would reduce their volume of work; and then, would their whole number be required? The time is hardly ripe for any of them to be pensioned off, though there are some men in the industry who might not regard even that as a bad thing in the interests of the industry.

Manchester Cookers.

The electrical papers give the information that the total number of electric cookers installed in the Manchester electricity area was on March 31, 1927, 3029, and that the estimated total at the end of March next will be 4600—an increase in the twelve months of 1571. The report of the Gas Department to March 31 last showed that there were then 141,972 gas-cookers fixed, which was an increase in the twelve months of 6460. There were also in use 19,248 grillers, and 53,721 gas-fires, which latter figure was an increase of 4616 in the year. It would be interesting to know how many of the 4600 electric cookers are on Corporation housing estates, and how many are used by the employees in the Corporation Electricity and other departments. It is stated that the capital outlay on electric cookers is now too heavy to be met out of profits; but borrowing powers are not to be used in this connection before April next.

Bitumen Gas Explosions.

So long as bitumen has existence in any form in electricity supply systems—either as vulcanized-bitumen insulation or for the purpose of embedding cables—the electricity supply industry will have explosions ranging from highly disastrous ones to the minor disturbances of pavements and the public peace. It is an ancient trouble—more ancient than the gas or electricity industries acknowledge, because years ago the one innocently accepted responsibility, and the other snugly sat in ignorance of being the actual culprit, or at least its technicians professed to be unconscious of the fact. But the tragic disaster at Hebburn-on-Tyne came, and led to scientific investigation; and later there was the serious explosion at Nottingham, which was also scientifically explored. In both cases bitumen gas electrically generated was found to be responsible. Then came the inquiry by the Departmental Committee appointed by the Board of Trade; and they reported in 1914. Their suggestions have not had the effect of preventing these street explosions, as Acton, Piccadilly, and Manchester attest. The Piccadilly explosion was referred to in our editorial columns last week; and the Manchester one had brief reference in the "Memoranda." Fuller information tells us that the latter explosion wrecked a shop, and shattered two others, in Brook Street. The house and shop, it is reported, were "as fully wrecked as though a large high explosive shell had struck them fairly in the middle of the roof, and exploded in its passage through the first floor. Indeed, where No. 39 Brook Street stood, it looks as though it has been roughly cut out from between Nos. 37 and 41." The fact that electrical cables are mostly laid under the footways, close to the bordering houses, contributes to such happenings as this. The same applies to the Albemarle Street, Piccadilly, explosion, which set fire to the basement of the Royal Institution; it was the same in the Nottingham case, when a public house was practically wiped-out through the percolation of gas to the cellar. At Manchester the first warning that something was amiss was given by vacillating electric lamps; then smoke came from between the flagstones of the pavement; and the occupants of No. 39 heard rumblings under their shop. Fortunately, they went to take counsel with their neighbours, when their premises were blown to pieces. A few people were injured, but not seriously.

FORTHCOMING ENGAGEMENTS.

[*Secretaries of Gas and Kindred Organizations are asked to assist in making this diary of events as complete and useful as possible by sending the earliest intimation of all meetings.*]

Jan. 14.—SCOTTISH JUNIOR GAS ASSOCIATION (WESTERN DISTRICT).—Joint meeting with Eastern District in Edinburgh. Paper by Mr. J. G. Davidson, entitled "Organization in Theory and Practice."

Jan. 14.—LONDON AND SOUTHERN DISTRICT JUNIOR GAS ASSOCIATION.—Visit to the Waddon Works of the Croydon Gas Company.

Jan. 18.—ROYAL SOCIETY OF ARTS.—"Methods of Radiant Heating." By Mr. A. H. Barker, B.Sc., M.Inst.C.E. 8 p.m.

Jan. 19.—MIDLAND JUNIOR GAS ASSOCIATION.—Meeting in Birmingham. Paper by Mr. D. J. Ward on "Odds and Ends about a Gas-Works."

Jan. 21.—YORKSHIRE JUNIOR GAS ASSOCIATION.—Meeting in Bradford. Lecture by Mr. H. R. Hiscott (Le Bas Tube Company, Ltd.) on the "Manufacture of Malleable-Iron Pipe Fittings, Wrought-Iron and Steel Tubing, &c."

Jan. 26.—MIDLAND ASSOCIATION OF GAS ENGINEERS AND MANAGERS.—Jubilee dinner, followed by cabaret, at the Queen's Hotel, Birmingham.

Jan. 27.—LONDON AND SOUTHERN DISTRICT JUNIOR GAS ASSOCIATION.—Meeting at the Westminster Technical Institute. Paper by Mr. F. M. Birks, O.B.E., on "Notes on the Mechanical Work at the Beckton Station of the Gas Light and Coke Company."

Jan. 28.—SCOTTISH JUNIOR GAS ASSOCIATION (WESTERN DISTRICT).—Visit to the Provan Chemical Works, Glasgow.

Feb. 14.—NATIONAL GAS COUNCIL.—Meeting of the Central Executive Board.

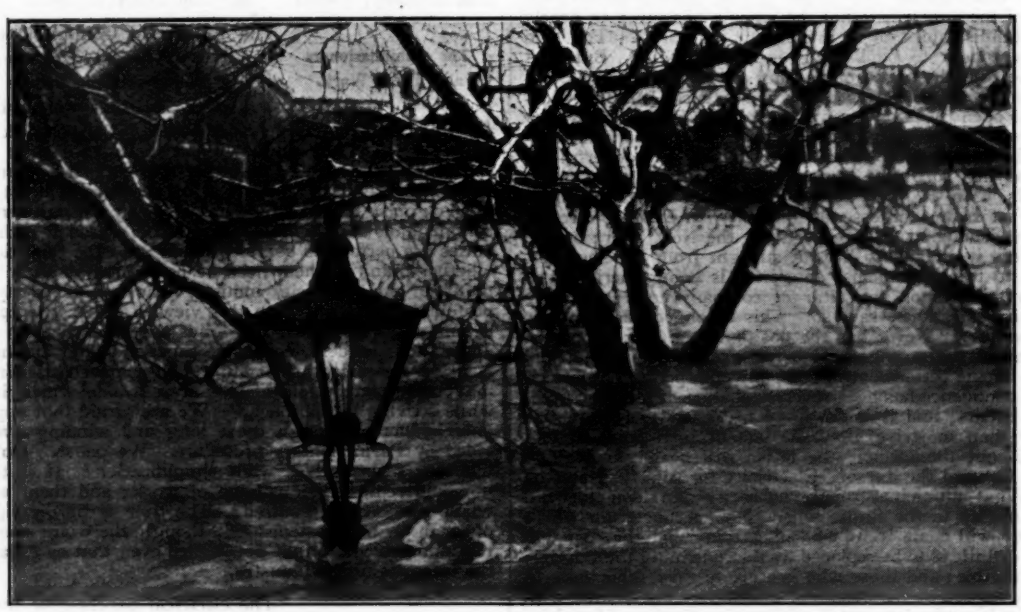
Feb. 14.—FEDERATION OF GAS EMPLOYERS.—Meeting of the Central Committee.

INSTITUTION OF GAS ENGINEERS.

Feb. 13.—Emergency Committee, Finance Committee, Council Meeting.

Feb. 14.—Gas Education Executive Committee.

DEVOTION TO DUTY.



[*Photo. by H. W. Hillier.*

THE FLOODS AT MAIDSTONE.

Although the standard was submerged, the lamp shown in the photograph continued to function automatically, being fitted with a "Rota" controller, supplied to the Maidstone Gas Company by the Sutherland Meter Company.

Imperial Chemical Industries, Ltd.—In the first issue of the new magazine of the firm, Sir Alfred Mond explains that it stands for the new spirit in industry—the desire of those charged with the responsibility of conducting the affairs of a great company to keep in communication with their thousands of co-workers throughout the country and throughout the Empire.

Institution of Chemical Engineers.—Application forms (returnable March 12) and particulars of the Associate-Membership Examinations for 1928, together with the Memorandum on "The Training of a Chemical Engineer," may be obtained from the Hon. Registrar, Mr. C. S. Garland, Institution of Chemical Engineers, Abbey House, Westminster, S.W. 1.

AUSTRALIAN GAS INSTITUTE.

Presidential Address of ANDREW WILSON, M.Inst.C.E., General Manager and Secretary of the Australian Gaslight Company.

[Second Annual Conference, held in Sydney on Nov. 15, 16, and 17, 1927.]

Your late President, at the inaugural meeting of this Institute, gave you a most inspiring address which outlined the history and growth of the gas industry in Australia, and drew vivid pictures of the giants who had shouldered its burdens—an address which must have created in you a desire, nay, a determination, to place the standard of the industry on even a higher pinnacle. I venture in the following remarks to offer suggestions which I trust will assist you in pursuing that determination.

Let us first endeavour to survey the Australian gas industry as a landscape viewed from the usual point of outlook allotted to the public—*i.e.*, the Press—and having so surveyed it, let us note the weak points in our lines of defence, and consider how best to strengthen them.

The first impression gained when the Australian gas landscape is surveyed is that visibility is poor. Being curious as to the cause of the poor visibility, we are constrained to inquire thereinto, and we readily determine that it is due to an agitation of the Australian atmosphere caused by a myriad of electrical discharges—of a propaganda character. Being satisfied as to the cause of the obscurity, and equally that there is danger to our industry—if for no other reason than because of the consequent distortion of the public vision—it behoves us of the gas industry, and of this Institute in particular, to clarify that vision.

ELECTRICAL COMPETITION.

Australia is flooded with advertisements by our electrical competitors, advertisements designed to touch the public through the weak spot in its armour. So many wonderful things have been done by electricity that the public is prepared to accept as gospel any statement regarding electricity; and nothing short of a miracle would astonish it. When it is told that all, or nearly all, the drudgery of labour can be eliminated by means of electrical appliances, that heat for whatever domestic purpose can be released in our homes by merely turning a switch, that there need be no dust or dirt from the laying in of a supply of coal, no worrying over stoves or furnaces, there is a ready response in the public's mind—a response the more ready as the wish is father to the thought. But is the public equally told at what cost all these things can be achieved? I venture to say "No," and I further venture to say that the public is buying its electrical experience in the domestic sphere dearly, as electric heating from an economic standpoint is as yet an alchemist's dream.

Is it not our duty to educate the public as to the relative costs of gas and electricity for domestic purposes? If we are aware, for instance, that in Sydney during 1926 for one penny spent on gas the public got 8353 units of heat, whereas for one penny spent on electricity only 1896 units were obtained—barely one fourth—should we not broadcast it? Being aware that for ordinary domestic cooking—the great proportion of which is of the nature of boiling—electricity cost in Sydney in 1926 two-and-a-half to three times as much as gas, have we not a weapon whereby we can defend our industry? In our travels through our cities, though we are continually faced with the notice on a new residence "This is an All-Electric Home," we seldom, if ever, see one to the effect that "This is an All-Gas Home." Truth to tell, gas is such an old-established and universal commodity that its very absence is made the occasion for advertisement, and for that subtle appeal which electricity is peculiarly capable of making. I never see that notice —"An All-Electric Home"—but I am reminded of Abraham Lincoln's saying: "You can fool some of the people all the time, you can fool all the people some of the time, but you can't fool all the people all the time."

Comes the question, "What is the remedy?" The answer is not far to seek. "In full fair tide let information flow; that evil is half-cured whose cause we know." Let information flow! There is our watchword; and I can conceive no better. You have before you to-day a report by your Committee on "The Best Means of Combating Electrical Competition." That report I commend to you for your most careful consideration in the hope that, as the logical result of that consideration, you will determine that steps be taken by this Institute to secure that co-operation of effort in the education of the public in gas matters which is so necessary to the well-being of the industry.

AN EXAMPLE OF INJUSTICE.

If a particular example is needed to spur the gas industry in Australia towards the goal of co-operation, let me draw your attention to the case of Canberra—the capital city of our Commonwealth. In a young nation such as is Australia, the desire to keep abreast with the times is a laudable trait; but when the craze for modernity outruns sound judgment, passes beyond the bounds of practical politics and ignores the experience of older nations, it becomes time to call a halt. It is within your knowledge that a fiat has been issued by the powers who control the development of Canberra that Canberra shall be an "all-electric city," and that gas shall not be permitted to intrude within the sanctuary thus to be created. Such a decision cannot be allowed to pass unchallenged by the gas industry. The decision referred to is momentous and unique, and has been the subject of nation-wide comment. That it came as a surprise even to the electricity industry, and necessitated some bolstering up, is, I contend, evident from the following, which appeared in "The Electrical Engineer" for June 15, 1927:

> The estimated price at which gas could be sold at Canberra compares not unfavourably with the prices paid to other undertakings of similar size, particularly when the extensive nature of the reticulation and the present cost of plant are taken into account. But the gas undertaking could only be successful by practically excluding electricity from the field of cooking and house heating; in other words, the gas undertaking could only prosper at the expense of the electrical undertaking. If, in a city such as Canberra, electric supply is to be provided at a reasonable cost to consumers, and at the same time the undertaking is to pay its way, the domestic load must be encouraged to the fullest possible extent. Therefore, though it must be acknowledged that gas has many advantages for heating purposes, it would appear to be a wasteful duplication of services to instal a gas undertaking when there is already an up-to-date electricity supply available.

You will note that gas is acknowledged to have many advantages for heating purposes—advantages presumably of a financial character, and accruing to the consumer. Yet the consumer in Canberra is not to be permitted to enjoy these advantages, but must perforce put his hand in his pocket to help the electricity undertaking to "pay its way." You will further note that "the gas undertaking could only prosper at the expense of the electricity undertaking," a result apparently not to be contemplated or endured. Yet the writer of that article could, with even greater truth, have said that "the electricity undertaking could only prosper at the expense of the consumer." From that article it would appear that the success of the electricity undertaking must have been the principal factor in the making of the decision. I venture, however, to suggest that the factor of prime importance should have been "cost to the consumer." As to "cost to the consumer," it would appear, from what information is obtainable regarding the price charged for electricity in Canberra, that gas would have to cost some 16s. per 1000 c.ft. before the costs—for domestic purposes—of the two services would be equal. Such a price is not charged by even the least efficient gas undertaking in Australia; and as advantage would naturally be taken of the latest and best methods of manufacture and distribution in the design and lay-out of a new gas installation such as would be required at Canberra, it may safely be assumed that the charge for gas would be nowhere in the region of such a figure. There exists not only a doubt as to the wisdom of the decision, but a grave amount of discontent on the part of the residents of Canberra at the deprivation of comfort which they are to be forced to endure. I therefore venture to suggest to the powers responsible for the decision that, in the interests not of the gas industry, but of the future of Canberra, the matter be reopened. These powers are certainly brave men to have made such a decision. Let us hope that they will prove to be equally reasonable men, and let this Institute assure them that in a matter so national in its character and of such far-reaching importance, the advice and experience of this Institute as to "cost to the consumer" are at their disposal. Now having pierced the obscurity, let us see what features of the gas landscape attract our attention.

PROGRESS OF GAS.

First, despite the inroads by competitors, the industry continues to expand. As an example of such expansion, I may cite the case of the Company which I have the honour to serve. Over the period 1920-26 the annual sales of gas increased from 29 million therms to 35¼ million therms. It must, however, be noted that the annual consumption of therms per consumer decreased from 179 to 166 during the same period. That decrease must be directly attributed to the encroachment of electricity and to the consequent loss of the lighting load—an encroachment which demands our immediate attention. At the same time it is interesting to note that, whereas the annual consumption of electricity, as purveyed by the Sydney municipal electricity undertaking during the same period, increased from 3¼ million therms to 8 million therms, the annual consumption per consumer decreased from 68 therms to 51 therms. When regard is had to that decrease, it must be concluded that the expansion of the business of the electrical undertaking has been made at some considerable expense, having been achieved by the inclusion of a great number of unprofitable consumers. That this conclusion is correct is borne out by the fact that for some considerable time past the electricity undertaking has

been conducted at a loss—a loss involving many thousands of pounds per annum. The necessary bolstering-up has been furnished by the municipal rates, which has been fortunate for the undertaking, though unfortunate for the consumer, inasmuch as the truth as to the cost of his supply is hidden from him, and unfortunate for the ratepayer, particularly he who is not a consumer. Were gas undertakings in Australia—the principal of which are company-owned—similarly conducted, the result could well be imagined. The progress of our industry would be at a standstill—the progress of our cities would be at a standstill—as a full and increased supply of such a necessary commodity of city life as gas would not be forthcoming; capital being unobtainable. Yet electricity undertakings of a municipal character "get away with it."

Further evidence of the continued and satisfactory progress which is being made by the company-owned gas undertakings in Australia is found in the many additions to capital which of recent years have been required. That the investing, and therefore thinking, public recognizes the solidity of the gas industry is evidenced by the readiness with which such additional capital is subscribed.

Technical Advancement.

Strenuous endeavours in a technical direction are being made by the industry to improve its position, particularly by the larger company-owned undertakings, whose works to-day are, on the average, as modern and as well equipped as any in the world. As an example of the efforts which are being made to counteract the effects of the apparently ever-increasing cost of labour in Australia, it may be stated that the quantity of gas produced per man per week in the works of the Australian Gas Light Company has increased by 27 p.ct. during the past six years. Advancement of a similar character is being made by all the larger company-owned undertakings. I wish I could speak similarly of the municipally-owned undertakings. Such undertakings, as a rule, are to be found in country towns of no great magnitude; and, while there are some notable exceptions, it is unfortunately true that they are generally in none too flourishing a condition. The cause is not far to seek—viz., a continuing change of aldermanic control and a total absence of policy. The works have been allowed to run to seed; insufficient provision having been made for renewals. A good service has been impossible, despite the best endeavours of the manager; and dissatisfaction on the part of the consumers has become so general that electricity has been turned to as the panacea.

Following upon the installation of an electric service—an installation which would not have been necessary had a reasonable policy been followed and some degree of business acumen displayed in the first instance—the gas undertaking has been allowed to drift. It is apparently not recognized by the average country alderman that a considerable measure of technical progress has been made by the gas industry since the local gasworks were established. That ignorance it should be the duty of this Institute to dispel. It is not to the credit of the industry that there should be a continued want of efficiency displayed by country gas undertakings—a want of efficiency the more marked when a comparison is made with country electricity undertakings in which some considerable degree of technical control is exhibited. In too many instances the gas manager is not permitted to make the best use of what technical knowledge he possesses or can acquire; the interests of the gas undertakings being subservient to the interests of the electricity undertakings, because, forsooth, the latter must be maintained as proof of the up-to-dateness of the town. The remedy is the education of the Australian public in gas matters by a system of gas publicity.

Co-operation with Architects and Builders.

Another matter which obtrudes upon our view is the apparently total want of interest in gas which is displayed by architects, builders, and those responsible for the thousands of buildings which are yearly springing up in our cities and towns. For that want of interest the gas industry has itself to blame. Possibly nowhere could a better ambassador for gas be found than the architect. Yet he is neglected. That neglect should be remedied. As to the speculative builder, who is his own so-called architect, it is hard to know how best to influence him with whom cost alone counts. However, the inducement may be found in the carrying-out of all gas fitting and installation work by gas undertakings at a cost which would return a small and, in the circumstances, reasonable profit, which would be materially less than the cost of such work as carried out by other and less interested parties. Such a course offers at the same time the opportunity to improve the quality of the appliances and fitting work installed in consumers' houses; and the consumer could be assured of the most satisfactory service.

While several gas undertakings in Australia maintain a system of inspection of the work performed by private gasfitting firms, particularly on new installations, there yet remains much room for improvement. The almost total absence of legal power to enforce even the most reasonable requirement is peculiarly hampering to an undertaking which is endeavouring to give good service. While it is impossible to expect that in the various States there could be uniformity of law relating to the installation of gas, yet it would be a very desirable thing if Model Regulations for the carrying out of such work could be framed by this Institute, and endeavours made by the undertakings in each State to have such adopted and made enforceable. Too much of the dissatisfaction with the supply of gas in the past has arisen from faulty or inadequate appliances and fittings, and from the refusal of the landlord, or the inability of the gas undertaking, to remedy such. The installation only of appliances which comply with definite standards of efficiency and safety is likewise a thing to be striven for. Recently the New South Wales Commercial Gas Association have taken steps to institute such standards along the lines adopted by the American Gas Association, and with very promising results; the various makers of appliances having willingly offered their co-operation. Such an effort should, however, be national in character if the best results are to be obtained.

An Australian Commercial Gas Association?

From the foregoing remarks, it will, I hope, be evident that in some way there should be a combination of effort on the part of all the gas undertakings in Australia, so that such effort—and it should be no mean effort—may be properly controlled and rendered most efficient. In my opinion that control, however, does not rightly lie within the province of this Institute, though this Institute is the very medium by which such a combination of effort can be brought about. I therefore commend to you the suggestion that an Australian Commercial Gas Association be formed, one of whose functions it would be to co-ordinate the publicity activities of the various gas undertakings in Australia, and to educate the public in matters of gas. Another function of such an Association could be the compiling of statistics relating to the supply of both gas and electricity, so that its members would be armed in the most efficient way to meet electrical competition. Again, as no better means for the improvement of the industry can be found than in competition and friendly rivalry between undertaking and undertaking, the compilation of records and statistics in the form of "Field's Analysis" could likewise be undertaken by such an Association. Yet again, the establishment of a research laboratory, which is a matter of the most vital importance to our industry, and for the establishment and control of which no better authority than such an Association could be found, might well be another activity. The making of a complete and accurate survey of Australian coals, and the determination of the best and most suitable system for the carbonization of individual coals, are matters which only a research laboratory established and financed by the Australian gas industry could accomplish. In many other ways such a laboratory would prove of inestimable value to the industry; its usefulness being bounded only by the ability of the industry to finance it. It may be that there are difficulties in the way of the formation of such an Association because of the existence of minor Associations of a somewhat similar character; but such difficulties are not insuperable. Your incoming Council will doubtless give the suggestion their serious consideration.

Yet another matter which would seem to demand co-operative effort on the part of Australian gas undertakings is that of the marketing of tar. As an example of co-ordination of effort in this direction I would point to the British Road Tar Association—a recently created body which may rightly be expected to prove of great assistance to the gas industry in Britain. That a body on somewhat similar lines, or, at least, with somewhat similar objects, should be formed in Australia, is my hearty recommendation to you.

Gas Legislation.

Australia has been called "the laboratory of political experiment;" and in the case of its gas legislation the name is indeed well deserved. Australian gas legislation, as perpetrated by various States, is uniform only in its expression of the desire to control the supply of gas. In all other respects—quality and pressure of gas, the form of accounts, dividends, provision for replaceemnt of plant, &c.—there is little, if any, similarity. While I do not suggest that there should be any attempt made by this Institute to secure alterations of the various State Acts controlling the supply of gas, I do think that on occasions, when alterations are proposed by a State Legislature, this Institute should endeavour, with the consent of the gas undertakings in that State, to secure improvements along the lines of that most enlightened Act—the Gas Regulation Act. The freedom which is now enjoyed by British gas undertakings, and the added ability to meet competition with electricity, which have resulted from the passing of that Act, are looked upon by Australian gas undertakings with a considerable degree of envy, and are things to be striven for.

River Pollution.

The Joint Advisory Committee on River Pollution set up by the Minister of Health and the Minister of Agriculture and Fisheries (of which Sir Horace Monro, K.C.B., is Chairman) have decided to invite certain bodies administering the Rivers Pollution Prevention Acts to give evidence at the next meeting of the Committee on Feb. 2.

EDUCATION IN INDUSTRY.

A PLEA FOR CO-OPERATION.

The Association for Education in Industry and Commerce, whose aim is to encourage definite educational work in industrial and commercial undertakings, appropriately makes its half-yearly meeting part of the Annual Conference of Educational Associations held at University College, London. This year (on the afternoon of Thursday, Jan. 5) Dr. Herbert Schofield, M.B.E., B.Sc., A.R.C.S., Principal of Loughborough College, gave an address on "Recent Education Experiments in Industry," illustrated by a large and interesting collection of lantern slides showing the educational work carried out by a number of firms who are members of the Association. The chair was taken at the opening of the proceedings by the President of the Association, Sir David Milne-Watson, LL.D., D.L., Governor of the Gas Light and Coke Company; and special reference was made to the educational scheme of the Company, with slides showing the apprentices engaged at Watson House and Westminster Technical Institute.

Sir DAVID MILNE-WATSON, on taking the chair, explained that he would have to leave almost immediately to attend a meeting of the Mond Committee on Peace in Industry, of which he was a member. The Association for Education in Industry and Commerce, under whose auspices this lecture was being delivered, he went on to explain, held its annual meetings in the summer—usually in the town in which the President had his works or his business interests. This year, as he had the honour of being President, the place of meeting was London; and it would be recalled that there were valuable conferences extending over three days last June. Then for several years they had been in the habit also of having a meeting at this time of year, when University College kindly opened its doors to educationists generally. While at the summer conferences the Association addressed itself mainly to industrialists, at the University College meetings (the gathering being composed largely of the teaching profession) the appeal made was chiefly to educationists. Education and industry were certainly complementary to each other; and the Association desired to let the teaching profession know what were the views of industry on the question of education. They were very pleased to have with them Dr. Schofield, who was in the unique position of being head of the only college in this country which had attached to it an actual factory, and sold the articles which were produced there. It was a most interesting experiment; and he hoped that it paid. At any rate, he had not heard of any complaints from the trades unions that they were encroaching upon their work. [Laughter.]

GIVE CREDIT WHERE CREDIT BELONGS.

Proceeding, Sir David said he understood that, partly because he was their President, a large number of the slides that were presently to be shown would have reference to the work that was being carried on in Watson House—the training centre of the Gas Light and Coke Company, which had been named after him as a compliment. Though one of the biggest, his own undertaking was not by any means the only one which carried into practice this idea of education in industry in connection with young people after they had left school; and this was a point he wished teachers to note specially. He did not think the industry of the country always received the credit it deserved for all that it was doing in this direction. Such work was being done up and down the country; but very little was known of it. The view taken by his own Company was that there was a very close relationship between industry and education. They were not asking the schools in any way to teach technical subjects to boys up to fourteen years of age. They would be quite satisfied, as an industry, if the youths came to them possessing a good sound general education. Above all things, they should be taught at school to think. One of the greatest obstacles to their progress in later life was that so many boys and girls had not been early taught how to think. Another highly important thing was character. If a boy was to be successful after leaving school his character must be such as to make him malleable, for working-up into something that would be useful to industry. It would be impossible to lay too much stress on these two points. It was for the teaching profession to say what kind of education would be most likely to develop character and the ability to think. Industry sincerely desired the co-operation of educationists in this matter. Much useful information could be obtained by teachers visiting factories and commercial establishments in their various districts; and industrialists would be only too pleased to grant facilities for such visits. Of course, in towns having staple industries the problem was greatly simplified; it was in places where many forms of industry were established that difficulty was more likely to be experienced. But in any circumstances it would be all to the good if the teaching profession would keep in touch with industrialists, and learn what industry wanted.

VOLUNTARY SCHEMES GROWING RAPIDLY IN NUMBER.

Dr. SCHOFIELD then proceeded to deliver his lecture, entitled "Some Recent Educational Experiments in Industry." Referring to the failure of the Fisher Act of 1918, which had for its object the provision of part-time education for young people engaged in industry, he remarked that this Act at any rate served one useful purpose, in that it brought prominently before the public eye the need for further education through the years of adolescence. Before the Act was introduced, a number of prominent firms had already seen the advisability of doing something of the kind for their young employees; and many years previously such provision was by no means unknown. The list of firms who are prepared voluntarily to adopt a measure of this kind is growing rapidly, and what is most encouraging is that in very few cases indeed, after having once adopted such a scheme, does a firm retreat. Such education is generally given on one day per week or on two half-days; time thus spent being paid for at the ordinary rate of wages. In the case of his own authority, no fee or any other charge is made to any students sent to the College by firms under such an arrangement.

WORK AT WATSON HOUSE.

The lecturer then showed, and explained, a large number of slides illustrating different phases of the schemes in operation in many manufacturing undertakings. Among them was a series referring to the educational facilities of the Gas Light and Coke Company. He expressed his indebtedness to the staff at Watson House for some general details concerning the work carried on there.

Broadly, he said, the work at Watson House is divided into education and research. The education side is concerned with staff pupils, apprentices, students, and workmen already employed by the Company as fitters and assistant fitters. The staff pupils enter the Company at about 17 or 18 years of age, having already matriculated; and they have a pupilage of about four years, during which time they take part in all the various sections of the Gas Sales Department. The apprentices begin between the ages of 14 and 15, and of these about 100 boys enter the Company's scheme each year. This scheme extends for six years, so that one speaks in terms of no fewer than 600 boys. During the first two years these boys attend at Watson House for the whole of their vocational training, and are allowed, in addition, to attend for one whole day or two half-days at the Westminster Technical Institute for day continuation courses.

Two points are well worth emphasizing. The first is the obvious one of the very effective co-operation between the work at Watson House and the tuition given by the London County Council at the Westminster Technical Institute. This prevents any wasteful over-lapping, and also makes full use of the existing educational machinery of the London Education Authority. The second point is that the day continuation courses at Westminster are planned on very broad cultural lines, providing for full time being given to "liberal studies." This apprenticeship scheme provides the Company with a large number of highly competent instructors every year.

In the research work, the staff pupils and apprentices are further permitted to associate themselves in various ways with the work carried out in the laboratories and testing rooms. The staff pupils are obviously of great use to the laboratory staff, and at the same time acquire unique experience regarding the technical side of gas supply.

Although the apprenticeship scheme provides the Company with a considerable number of highly competent fitters every year, there is already in the Company a large staff of experienced fitters who have acquired their skill and knowledge in a general way. These men are allowed to attend Watson House for intervals of a week; and a well-equipped instructional workshop, supervised by experienced foremen, is available, so that these men can receive instruction in the most recent developments of their craft.

THE TEACHERS MUST HELP.

Mrs. M. A. CLOUDESLEY BRERETON (Chairman of the Press and Propaganda Committee), who took the chair when the President had to leave, said that, as the result of her experience, she had come to the conclusion that teachers did not perhaps quite realize how much industry was doing to help in the matter of education. The lecture would have served a very useful purpose if it encouraged teachers to go out and learn what was being done in industry, so that they might be enabled to adopt the best means of co-operating in this great work. Though doubtless not even the majority of employers were undertaking

schemes on the scale which they had seen illustrated that afternoon, many more were doing so than was generally realized by teachers.

THE PART OF THE SMALL WORKS.

Mr. F. W. GOODENOUGH, C.B.E. (Chairman of the Education Committee of the Gas Industry), said the Gas Light and Coke Company and the London County Council worked hand in hand in this matter; and the Company had found the assistance of the Local Education Authority very valuable. The problem of continued education so far as it concerned the smaller gas-works of the country had not been completely solved. The education schemes of the gas industry were, however, to-day quite in their infancy; and it was hoped to profit by what was being done by other industries. It was not so much the size of the undertaking concerned that really mattered, as the determination of those responsible to do the right thing. After all, there was such a thing as co-operation between employers; and he did not see why several engaged in the same industry should not combine in a scheme for the education of their employees.

EMPLOYEE TRAINING ESSENTIAL TO SUCCESS.

Mr. KEMPTON (Chairman of the Executive of the Association), who was one of several other speakers, declared that education pays from every point of view, and that employee training is an absolutely essential thing to-day to success in industry. The members of the Association wished to educate their young people to take a broad-minded view of industry; but they also desired that these young people should know something about industry before actually entering it, and in imparting this knowledge visits of teachers and students to different works were of the greatest possible value.

A hearty vote of thanks to Dr. Schofield concluded the proceedings.

GAS FOR REFRIGERATION.

Why the Load is Particularly Valuable.

Great interest attached to a lecture which Mr. J. G. Clark, of the Gas Light and Coke Company, gave before the Southern District (London Area) Gas Salesmen's Circle on Jan. 3, a report of which, and of the subsequent discussion, is published in the "GAS SALESMAN" supplement to-day. The lecture was entitled "Some Aspects of Evaporation and Condensation in Gas Supply;" and Mr. Clark, towards the end of his lecture, explained the bearing of his subject on what at present is a topic of first-rate importance—refrigeration. The year 1928 heralds a new era in the matter of Britain's food supply. The new regulations prohibiting the use of preservatives in food will necessitate proper storage of perishable foods. Retailers will certainly have to instal refrigerators; and it will not be long before most homes are complete with small refrigerators. Even apart from the new regulations, some form of cold storage in the home is most desirable; and the only reason why Britain is so backward in the matter is that until recently no reasonably priced plant was available in this country. Certain it is that all those who have installed refrigerators regard them in no sense as luxuries. They wonder how they managed without them—in precisely the same way as a woman who instals a gas cooker wonders how she carried on with the coal-fired range.

GENERAL INTEREST IN REFRIGERATION.

In view of the new regulations regarding foodstuffs, it is certain that manufacturers of refrigeration apparatus will enter on a wide publicity campaign. In other words, interest is going to be created in the public mind. Refrigeration will be a topic for discussion. Now Mr. Clark, in his lecture, demonstrated how efficiently gas can be applied to refrigeration; and Mr. Gustaf Berg, of Electrolux, Ltd., in the course of the discussion, mentioned that in collaboration with individual experts in gas undertakings, slight alterations have been made in the first pattern of "Electrolux" refrigerator to which gas was applied. These alterations have been embodied in the new model, which now works eminently satisfactorily with gas. It was explained by Mr. Berg that when gas was first applied to the "Electrolux" there was difficulty in maintaining constant efficiency, due to slight variations in gas pressure. The apparatus worked efficiently when 3 c.ft. of gas was burned. If, however, due to excess pressure, greater heat was supplied, the normal working was disturbed. However, since then improvements have been made which render gas a reliable and foolproof agent for the production of cold.

THE ENORMOUS VALUE OF CO-OPERATION.

Minor alterations such as the provision of adequate flue area to ensure that the products of combustion leave the apparatus above condensation point, and so on, have effected enormous improvement; and these alterations are the result of collaboration between the makers of the appliance and the gas industry. The idea that makers of appliances which consume gas should co-operate with the gas industry to produce really satisfactory apparatus is excellent, and should be encouraged. As Mr. Clark observed at the meeting to which reference has been made, there may be firms which make cookers which are splendid from the foundry point of view, but which lack that fine balance between chemistry and engineering which makes for success of the appliance, and consequently satisfaction of the consumer and the gas undertaking. As a matter of fact, all types of gas appliance are tested at Watson House, where the chemical and physical aspects as they affect the gas industry can be studied.

THE WONDERS OF GAS.

For well over a century gas has served the public faithfully and humbly. Its services have been so well performed that the public now take them as a matter of course. How often does the man in the street think about gas? Normally, perhaps, four times a year—when he gets his bills. He gives no thought to the extraordinary (and, it can be truly said, romantic) variety of purposes for which gas is used—from the ripening of bananas and the manufacture of buttons to the heating of furnaces and the lighting of cities. On the other hand, his imagination is constantly being stirred by electricity, which can be used to actuate Robots, and so on. How excellent therefore at the present juncture to broadcast the information that gas heat is the simplest and most economical agent for refrigeration purposes—the "flame that freezes!" When throughout the country interest is being taken in the subject, what good publicity could be given to gas by having window displays demonstrating the use of gas for freezing, and an intensive Press publicity campaign.

There may be some gas engineers who would say, "A refrigerator consumes 3 c.ft. or less of gas an hour. Of what use is this load to us? We will take what comes our way, of course; but why worry about it unduly? They would undoubtedly be correct in regarding the load as inferior to that resulting from (say) a gas fire consuming 40 c.ft. an hour; but it is a constant load, and apart from any other consideration it enables the public to appreciate the wonders of gas. It is a load which will lead to greater sales in other directions.

IS INVESTIGATION NECESSARY?

Comparisons between the United States of America and this country are sometimes apt to be of little value, for the conditions operating in the two countries are so different. However, that the gas industry in America considers the refrigeration load well worth cultivating is demonstrated by the fact that last year the American Gas Association set up a Committee to consider the problem. In the report which they have published, it is recommended that gas companies should take an enthusiastic and active interest in the sale of gas refrigerators. The following is an extract from the report: "A steady, even, unvaried consumption, 24 hours a day, every day in the year—is this not the gas company's ideal load? A total annual consumption per home practically equal to the old lighting load that once sustained, almost unaided, the entire industry! But attractive as gas refrigeration is from the new business point of view—it is even more valuable in its splendid publicity power. A tiny gas burner that produces dry cold is as romantically wonderful as any of those uses of electricity that have captured the public imagination. A tiny gas burner that protects food and silently guards health calls attention, as strikingly as any of the devices of electricity, to the wonder and the variety of gas service."

The question naturally arises, Would it be worth while for the British Commercial Gas Association to set up a committee of inquiry into the aspects of refrigeration as they affect this country? The time is opportune; and, taking a wide view, it appears that the subject merits more than casual observation. There is no doubt that the electricity industry is going out wholeheartedly for the refrigeration load. A committee such as that suggested could investigate both small and large refrigerators, to discover whether alterations in their design would render gas a more efficient working medium; it could consider whether standardization could be effected, to reduce costs and induce architects to specify gas and make provision for piping; it could offer advice to gas undertakings as to the efficient installation of refrigerators; and, finally, it could formulate an effective publicity campaign of a comprehensive and uniform nature.

Mr. Alexander Dickson, of Bromley, left estate of the value of £26,527.

GAS BILLS FOR 1928.

As will have been seen from the intimation which has already appeared in the "JOURNAL," notice has been given of the intention to promote in the next session of Parliament only about a dozen Private Bills containing clauses relating to gas supply.

BARNET GAS AND WATER COMPANY.

The first of these is a Bill by which the Barnet District Gas and Water Company seek various provisions concerning mainly the water portion of their undertaking—one of them to enable the Company, if they think fit, to require that all water used for, or in connection with, refrigerating apparatus shall be taken by meter and paid for at the rates for the time being in force for meter supplies, or on such other terms as may be agreed. There is a clause in the model terms for the provision of a valve by gas consumers where high pressure air or other gas is used; and the Directors desire power to establish a contributory pensions fund.

[*Parliamentary Agents: Messrs. Rees & Freres.*]

BLACKPOOL EXTENSION.

The Blackpool Corporation seek power to extend the boundaries of the borough so as to include the urban district of Poulton-le-Fylde, the urban district of Thornton-Cleveleys, and the townships of Carleton, Hardhorn-with-Newton, and Marton. As from April 1, 1929, the limits of the Corporation for the supply of gas shall include the added areas and the area within the limits of the Poulton Council for the supply of gas. On the same date, the gas undertakings of the Poulton-le-Fylde Urban District Council and the Thornton Urban District Council shall be transferred to the Corporation. The following subsection deals with the price to be charged for gas in the added area:

(*a*) During one year after the appointed day the prices to be charged by the Corporation for a supply of gas in the areas of the existing townships of Carleton and Hardhorn-with-Newton of the township of Singleton and of the Poulton district and the Thornton district shall not exceed the prices charged in those areas for corresponding supplies during the year immediately preceding the appointed day, unless those prices were below the actual cost of producing and supplying the gas including capital charges.

(*b*) During the next succeeding nine years the prices to be charged by the Corporation for a supply of gas in the areas mentioned in this sub-section shall exceed the prices charged to consumers in the existing borough for a corresponding supply in like circumstances by the following sums:

(i) During the first five years of that period, 10d. per 1000 c.ft. in the Thornton district and 1s. per 1000 c.ft. elsewhere.

(ii) During the remainder of that period, 5d. per 1000 c.ft. in the Thornton district and 6d. per 1000 c.ft. elsewhere.

[*Parliamentary Agents: Messrs. Sharpe, Pritchard, & Co.*]

BOURNEMOUTH GAS AND WATER COMPANY.

This is a Bill which relates to both the gas and water branches of the undertaking. The Company ask for an extension of the limits for the supply of gas so as to include so much of the parishes of Corfe Mullen and Lytchett Minster as is not now within the limits—with the exception of one part of the latter parish. The Company are to have power to raise additional capital not exceeding in the whole £400,000, by the issue of 5 p.ct. capital and new preference and ordinary shares or stock. The dividend on such preference capital is not to exceed 6 p.ct. per annum; and that on the ordinary shares or stock, 7 p.ct. per annum. The rate of dividend on the 5 p.ct. capital is to be subject to the sliding-scale. There is provision for the offer of shares or stock for subscription by the public, and for the payment of a commission not exceeding 5 p.ct. Borrowing powers are included—not exceeding in the whole (together with the sums already borrowed) £639,255, and one-half of the amount (including premiums) for the time being raised after the passing of the Act. There are some general clauses on model lines. It is asked that no person shall be entitled to a stand-by supply of gas unless he has agreed to pay such minimum annual sum as will give the Company a reasonable return on the capital expenditure incurred by them in providing such supply. Another clause is to give the Company power to exercise breaking-up powers where the limits of supply are bounded by, or abut upon, any street or road wholly outside such limits, for the purpose of supplying gas or water to the owner or occupier of any premises abutting upon such street or road, and being within such limits. The clause is in the following terms:

As to Streets and Roads forming Boundary of Gas or Water Limits.—Where the limits of supply are bounded by or abut upon any street or road wholly outside such limits, the Company may, for the purpose of supplying gas or water to the owner or occupier of any premises abutting upon such street or road and being within such limits, exercise with respect to such street or road the like powers of breaking-up the same for the purpose of laying, maintaining, inspecting, repairing, and renewing pipes as are exercisable by them with respect to streets or roads within the limits of supply and subject to the like conditions; and the owner or occupier of any such premises may, for the purpose of laying any communication pipe or of complying with any obligation to maintain any pipe or apparatus which he is liable to maintain, exercise the like power of opening the ground between any main or pipe of the Company and his premises and of opening or breaking-up so much of the pavement of the street as shall be between such main or pipe and his premises and any sewer or drain therein as if such street or road were within the limits of supply. Provided that nothing in this section shall entitle or require the Company to supply gas or water to the owner or occupier of any premises abutting upon any such street or road as aforesaid and being outside the limits of supply.

[*Parliamentary Agents: Messrs. Dyson, Bell, & Co.*]

DOVER GAS COMPANY.

This is a Bill to provide, in the first place, that the Company may from time to time, with the consent expressed by resolution of three-fifths of the votes of the shareholders present in person or by proxy at any general meeting of the Company when due notice for that purpose shall have been given, convert and consolidate, on a date to be fixed in each such resolution, the then existing shares and stock of the Company, or such portion thereof respectively as the said resolution may prescribe, into ordinary shares of the nominal value of £1 each. The powers of the Company remaining unexercised at the date of each such conversion of raising money by the creation and issue, either in whole or in part, of new ordinary stock or new preference shares or stock may be exercised by the Company at any time after that date by the creation and issue of additional amounts of ordinary or preference shares of the nominal value of £1 each. In addition to the total sum of £59,824 (which is nearly equal to one-third part of the total authorized capital of the Company issued and unissued) already borrowed, the Company may borrow such further sums as shall be equal in the aggregate to one-half of the paid-up capital, including premiums.

With a view to encourage investments of small amounts in the capital of the Company by their employees and consumers and others of the wage-earning class resident within the limits of supply, the Company regard it as expedient that they should be empowered to issue shares or stock to such persons on terms of paying therefor by instalments. Provision to this end is contained in the following section:

Special Provision for the Benefit of Small Investors.—Anything in the Acts relating to the Company notwithstanding, the Directors may, with the consent of the shareholders, reserve a proportion not exceeding one-fourth of each future issue of capital for exclusive offer in the first instance to the employees of the Company and to consumers and others of the like class within the limits of supply upon such terms and conditions as to payment therefor and the payment of dividends thereon until the same become fully paid as the Directors may prescribe.

Provided that every allotment of shares or stock under this section shall be at the same price as that at which the other shares or stock of the same issue shall be sold.

The Company shall not be required to comply with section 40 of the Companies Clauses Consolidation Act, 1845, as a condition precedent to borrowing in respect of any capital allotted under this section.

The next section gives authority to subscribe towards the capital of other companies:

Power to Subscribe towards Capital of other Companies.—The Company may, subject to the conditions hereinafter in this section prescribed, with the authority of three-fourths of the votes of the shareholders present in person or by proxy at a general meeting of the Company specially convened for the purpose:

(*a*) Subscribe towards the capital of another company; and the Company may take and hold shares or stock in the capital of such other company in respect of such subscription.

(*b*) Guarantee or join with others in guaranteeing the payment of interest or dividends or other annual payments on any shares stock or loan of any other Company.

(*c*) Lend money to on mortgage of the undertaking of any such other company.

Provided that no sum shall be subscribed, guaranteed, or lent under this section except only to an amount approved by the Board of Trade (which approval the said Board is hereby empowered to give); but the Board before giving such approval shall satisfy itself that such subscription, guarantee, or loan would conduce to the development of the output of gas by the Company or the turning to the best account the residuals and resources generally of the Company.

Provided further that any capital appropriated for the purpose of any subscription or loan under this section shall be within the limit of the total amount of capital for the time being authorized.

Basic prices are fixed for gas of 13d. per therm within the portion described as the inner area and of 15d. per therm within the remainder of the limits of supply; but any supply given by the Company to His Majesty's naval and military authorities, the Dover Harbour Board, the Southern Railway Company, and the Corporation of Trinity House in the outer area shall be at a charge not greater than that for the time being made to consumers of gas for the like purposes within the inner area.

At any time after five years from the passing of the Act, should circumstances justify it, revision of the basic price may be made by the Board of Trade. The basic rate of dividend is fixed at 7½ p.ct.; and the surplus profits are to be divided in the proportions of two-thirds to the consumers and one-third equally between the ordinary shareholders and the employee co-partners of the Company. The employees' share is to be distributed by way of bonus on salaries and wages or to be carried to a fund to be formed in connection with any profit-sharing scheme which may be established in accordance with provisions contained in the Bill. The Board may, with the sanction of the proprietors, arrange for one or more (but not exceeding three) of the employee co-partners to become a Director or Directors of the Company. Each such employee, at the date when he becomes a Director, shall have been not less than seven years in the constant employ of the Company, and shall for not less than twelve months prior to such date have held in his own right not less than £50 nominal value of the ordinary capital of the Company. If he ceases to hold this minimum, he will no longer remain a Director. The fees payable to an employee Director shall be not less for each attendance at a Board meeting than his ordinary day's pay, nor more than four times that amount. A minimum charge is proposed for stand-by supplies of 25s. per quarter. In connection with prepayment supplies, the maximum charges are: For meter and fittings (including a cooking stove), 3·6d. per therm; meter and fittings (excluding a cooking stove), 3d.; and meter without fittings, 1·8d. per therm or 10 p.ct. per annum on the cost of the meter, whichever shall be the higher.

[*Parliamentary Agents: Messrs. R. W. Cooper & Sons.*]

AMERICAN GAS ASSOCIATION.

NOTES FROM REPORTS AND PAPERS.—Fourth Article.

Some Gas Statistics.

A number of interesting figures were contained in a progress report of the Committee on Economic and Engineering Survey of the Gas Industry. From these it appears that statistics prepared by the American Gas Association for the year 1925, from a study of 234 companies selling 65 p.ct. of all the manufactured gas in the United States, indicate a total capitalization of the entire industry of approximately $2,400,000,000, and a gross income of some $465,000,000. This gives a capitalization of $5.16 per $1 of gross income. In other words, it requires somewhat more than five years to turn over the capital.

While the sale of gas has increased more than 100 p.ct. over the past ten years, the number of meters has gone up only 46 p.ct. This increased sale per meter reveals a very favourable situation, principally due to industrial business, though house heating has been a factor with some of the companies. It is felt, however, that this favourable showing for the past ten years should not induce those connected with the industry to become too optimistic, and expect the same improvement over future years. While the increase in the industrial business in the past has been so substantial, it has been of a kind which companies could obtain at comparatively high rates. After this class of consumption has been absorbed, the large volume of industrial business still available can only be obtained on a competitive basis, and at lower rates, and will therefore require more effort on the part of the gas industry to obtain.

More than 60 p.ct. of the total investment in production and distribution equipment is represented by distribution plant, most of which represents investment in pipes buried in the ground, and not easily accessible for observation as to condition. The average annual load factor of most distribution systems does not exceed 30 to 35 p.ct. In other words, the system is being used at its maximum for the equivalent of only 2628 to 3066 hours, out of a possible 8760 hours per annum.

Statistics relating to a number of companies show that the annual daily load factor is approximately 66 p.ct. That is to say, the maximum output of the production plant is only used for the equivalent of 241 days per annum. It may be assumed that a certain amount of reserve production capacity is provided over and above the maximum day's requirements; and this being true, the equivalent use of the invested capacity was less than 241 days per annum. This limited use of capacity results in a high rate per 1000 c.ft. for fixed charges, so it is important that investment costs of production equipment be kept as low as possible.

Efficiencies of Processes.

Further discussing the subject of their report, the Committee remark that the gas industry may well be proud of the thermal efficiencies of its processes. The Carbonization Committee have recently conducted a series of tests on various types of carbonizing plants, using the same coal in each test; and the results indicate that thermal efficiencies as high as 80 p.ct. are being obtained. Allowing 5 p.ct. unaccounted for (and many systems have less than 5 p.ct.), the industry is able to deliver in the form of gas or valuable products 75 p.ct. or more of the heat input. Not only is the efficiency of the gas manufacturing processes much greater than that of the electrical industry, but the operating cost of producing equivalent energy in the form of heat in carbonizing works is much lower than in electricity generating stations.

From the standpoint of investment, the gas industry has a good margin in its favour over the electrical industry. On a basis of 100 p.ct. load factor, the investment in electrical plants and distribution systems is about $12 per million B.Th.U. On the basis of 530 B.Th.U. gas, the investment in gas equipment and distribution systems with 100 p.ct. load factor is about $4 per million B.Th.U. This advantage in investment in favour of the gas industry is largely due to the fact that holders make it possible to store gas for peak-hour loads, and therefore production equipment need only be installed for maximum 24-hour demands. Since holder installations cost approximately one-third to one-fourth as much per 1000 c.ft. of capacity as production equipment, this represents a large saving in investment.

While, however, praising so highly the efficiency of the gas industry's processes, the Committee admit that the efficiency of some industrial appliances in particular is not very high; and they note with satisfaction the fact that steps are being taken to remedy this state of affairs.

Service for Industrial Consumers.

The servicing of industrial gas appliances formed the subject of a paper by Mr. A. M. Apmann, of the Consolidated Gas Company of New York, who adduced the following argument in favour of this policy: If we assume a fair average annual send-out per meter of 34,000 c.ft., and reduce this to other units, we shall find that we are not selling a commodity, but that we are actually selling service. Thirty-four thousand cubic feet of gas of 540 B.Th.U. value amounts to the amazing total of 18,400,000 B.Th.U. When compared with the available heat of 24,000,000 to 28,000,000 B.Th.U. in a ton of coal, what a lamentable amount this is! About three-quarters of a ton of coal per year per meter; and this includes every type of customer. Can we be said to be selling a commodity, when we are supplying the equivalent of three-quarters of a ton of coal per annum? A sale of 5 lbs. of coal a day per meter is almost child's play for this great industry. We are selling not a commodity, but merely a service. Why stop half-way? Let's go the whole way, and sell a complete service, which includes making the necessary adjustments, and cleaning and repairing the appliances which use our product. We hear complaints that the industrial business is impossible because of high gas rates; but if, instead of merely selling gas as a fuel, we sell gas with service, we are providing something which no other seller of fuel can afford to do. Then we are not in the fuel business, but rather in the industrial heating business, which is the field for gas. On this basis, the price of heating service is not out of line with the prices of fuel *plus* service which are necessary with all other sources of heat.

An Actual Example.

That such servicing systems are not mythical was shown by an actual example which was quoted by Mr. Apmann. This was the case of a large company whose industrial servicing is carried out under two separate divisions. One of these is the hotel and restaurant inspection and service, which is performed by men from the district shops. This gives flexibility of personnel, which is important in hotel work, as so many places are closed-down during certain periods of the year. In the company referred to, during 1926, 54 men were listed as hotel and restaurant inspectors. At five of the largest hotels, each with a consumption of approximately 3 million c.ft. monthly, calls were made twice weekly. Installations of from this size down to the lunch rooms with loads of 50,000 c.ft. monthly, the inspectors visit less frequently. However, every installation is inspected at least monthly. In 1906, the first hotel range was installed. In 1926, just twenty years later, 3600 restaurant customers, with a total consumption of just over 5000 million c.ft., had been added to the lines with never more than six salesmen, but with a yearly increasing number of service men. In 1926, the 54 men made 53,693 inspections. Burners were adjusted, mixers cleaned of grease and dirt, door latches fixed, springs tightened, cocks replaced, new oven linings installed, cooking tops rebricked, racks straightened, and about thirty other minor adjustments made. Over nine inspections were made daily by each inspector; and the cost, including materials used, averaged the immense sum of 61 c. per visit. "Does it," asked the author, "pay to spend three-fifths of a cent per dollar of revenue to build-up and keep a load of this kind?"

CORRESPONDENCE.

[We are not responsible for opinions expressed by Correspondents.]

Tar the "Most Suitable" for Road Treatment.

SIR,—I was interested in a card received this morning which depicted something unusual in print, although I considered it far truer than many sent out. The illustration on the card showed a road surface treated with British tar, and entirely satisfactory; it also showed surfaces treated with imported substitutes giving slippery surfaces, leading to skidding.

Generally, we have illustrations showing the wonderful results from imported material to the detriment of the home-produced goods.

As an angler and road engineer of years' standing, I give as my opinion, having tried without bias all materials advocated for road-surfacing, that ordinary gas-works tar, if properly dehydrated, is by far the most suitable material for road treatment. It is admitted that it can only be applied in dry weather; but if used properly I have known it penetrate the road surface a distance of 2¾ in.; and, while admitting that I have used substitutes in wet weather, I have done so solely because the weather was unsuitable for using the perfect material.

Presumably the gas industry is not in a position to boom British tar to the same extent as the various imported surface dressings, which are higher in price and less effective in results.

G. BERTRAM HARTFREE,
Borough Surveyor and Engineer.

Borough Hall, Godalming,
Jan. 4, 1928.

Glycerine and Gas Drying.

SIR,—I have read with much interest Mr. Harris's letter in your issue of the 14th ult., replying to my letter of Nov. 30 concerning the advantages of glycerine for gas drying.

In Mr. Harris's original article, Table 6 gave a $CaCl_2$ solution strength at approximately 77° Tw. at a temperature of 54° Fahr. Table 8 showed a saturated solution at this temperature to Twaddell at approximately 80°, so it is to be assumed that the $CaCl_2$ solution he uses is not quite saturated.

Below I set out in tabular form the vapour pressures of saturated calcium chloride solution and glycerine at 60 p.ct.

	V.P.
$CaCl_2$ saturated solution at 60 p.ct. . . .	= 4·55 mm.
75 p.ct. glycerine solution (with H_2O only) .	= 3·04 ,,
80 ,, ,, ,, ,, ,, ,, .	= 1·92 ,,
75 ,, ,, ,, (saturated with NaCl)	= 1·46 ,,

Mr. Harris has asked me to state on what authority the above figures are based. The figures given above for glycerine mixtures, I can assure Mr. Harris, are not approximations, but facts calculated from the "Duhring Lines." The latter, which form one of the most recent researches on glycerine, are given in a paper by Messrs. Carr, Townsend, and Badger ("Journal Ind. and Eng. Chem.," June, 1925, published by the American Chemical Society). The glycerine we use for gas drying is of the "Salt Crude" variety, and it may be concluded that the presence of the salt is advantageous so far as vapour pressure is concerned.

Concerning the reconcentration of glycerine, this is a process which is of considerable importance to soap distillers, and has been brought to a stage of high efficiency. I can assure Mr. Harris that this can be done, and is done, with losses below 0·25 p.ct. So far as gas drying is concerned, these losses represent a maximum cost for glycerine of not more than 6·4d. per million c.ft. I cannot agree with Mr. Harris that this is a material consideration.

The slightly greater viscosity of glycerine as compared with $CaCl_2$ solutions is, in our opinion, an advantage rather than a disadvantage, when used in a washer of the type depending on a contact between the gas to be dried and large quantities of "wetted surface," as it tends to give a thicker surface layer and so a higher contact efficiency.

Mr. Harris makes the statement that only 40 p.ct. of the moisture content can be removed by glycerine; but we can assure him that it is possible to remove 75 p.ct. of the water content of the gas. This figure is based on very careful experiments made with a washer of our "Standard" type; and there can be no doubt about the results obtained. Perhaps, in return for this statement, Mr. Harris will be good enough to let me know on what authority he suggests that only 40 p.ct. of the water content of the gas can be removed.

The mechanism of the absorption of water by liquids is a delicate question. It is undoubtedly a property that is dependent on the molecular constitution of the absorbent liquid. Glycerine has a complex molecular constitution $(CH_2\text{-}OH\text{-}CH\text{-}OH\text{-}CH_2\text{-}OH)_x$, and it seems probable that in this case there is an "adsorptive effect," depending on "loose chemical affinity," in addition to the ordinary absorption of water.

Quite apart from this, however, is seems only reasonable to expect that an 82 p.ct. solution of glycerine should have a greater affinity for water than a 40 p.ct. solution of $CaCl_2$, which we believe is about the strength used by Mr. Harris. The glycerine has fewer attached molecules of H_2O, or, in other words, is more "unsaturated."

Pp. KIRKHAM, HULETT, & CHANDLER, LTD.,
A. F. H. KNOWLES.

37-38, *Norfolk House,*
Norfolk Street, Strand,
London,
Dec. 29, 1927.

Reading and the Floods.

SIR,—I send you the enclosed copy of a letter written to "The Times," as it describes a somewhat odd coincidence.

D. H. HELPS,
Engineer and Manager.

Reading Gas Company,
Kings Road Works,
Jan. 5, 1928.

[COPY.]

Jan. 5, 1928.

SIR,—On the way to my office this morning, I read in a technical journal, the "GAS JOURNAL," for Jan. 4, an article entitled "The Piccadilly Bitumen Gas Explosion," from which the following is an extract:

> The "Times" report may be taken as an example of hopeless inaccuracy.

When I arrived at my office, my attention was called to the account of the floods, on p. 12 of to-day's "Times," dated Reading, Jan. 4. In it I read: "The gas-works are also threatened." There is no foundation whatever for this statement. The level of the water in the Kennet adjoining our works and just above the point where the Kennet runs into the Thames is now 25 in. below the level of the record flood in November, 1894; the water having fallen about 7 in. since this time (noon) yesterday. I would add that our works did not suffer at the time of the record flood.

Yours faithfully,
(Signed) D. H. HELPS,
Engineer and Manager.

The Editor,
"The Times."

REGISTER OF PATENTS.

Simultaneous Production of Water Gas and Cement. No. 280,763.

URBAIN, E., of Paris.

No. 5296; Feb. 24, 1927. Convention date, Jan. 20, 1927.

This is a process for simultaneously producing a gas similar to water gas, phosphoric acid, and an alumina-silicate slag having the composition of a cement. It consists in the combination of the preparation of phosphorus by the Wœlher process (in which a portion of the silica is replaced by alumina, yielding a high alumina cement slag) and the oxidation, in the presence of carbon monoxide, of the phosphorus produced to phosphoric acid. This is accomplished by using water vapour and a halogen acid in the presence of carbonaceous material (coal).

Gas Meters.—No. 281,101.

WILSON, J. S., and GLOVER, T., & CO., LTD., both of Edmonton, N. 18.

No. 31,985; Dec. 17, 1926.

This invention relates to the class of housing or support made in one piece for supporting, in a gas meter, the cranked spindle carrying the worm and tangent operated through levers and links from the bellows spindles and actuating the index mechanism.

According to the invention this housing is made from a half-circular base having a bearing block; a wall or walls projecting upwardly from the base; a platform on said wall or walls; a wall or walls on said platform projecting upwardly and terminating in a bridge; an extension on one wall for holding the index spindle; an extension for pivoting the rocking stop; and in some cases another extension for holding a rod in connection with coin freed mechanism—all cast in one piece.

The component is illustrated and fully described in the specification.

Taps.—No. 281,103.

SOUTH METROPOLITAN GAS COMPANY, and CHANDLER, D., both of Old Kent Road, S.E. 15.

No. 32,125; Dec. 18, 1926.

This invention relates to improvements in gas taps or cocks of the kind in which the cock is normally locked in position by a gravity actuated catch. The object of the invention is to provide locking means for a control cock which will prevent the accidental moving of the cock to the "on" position.

In one form of construction, as applied to a cock whose axis of rotation is horizontal, the pin is slidably mounted in the handle so as to slide in a vertical plane; the pin being provided with a head which is adapted to limit the travel of the pin by abutting against the handle. The end of the pin remote from the head is adapted, when the cock is in the "on" position, to engage the inner wall of a cup-shaped member, which, at a point vertically below the axis of rotation of the plug, is drilled to allow the pin to pass therethrough

when the cock is in the "off" position. The cup member is of such shape as to form a shield, and thereby prevent accidental actuation of the cock.

Preferably the pin is provided with a head of such shape as to enable it readily to be raised by the thumb or finger of the operator; and in operation, when the cock has been moved to the "off" position, it is necessary to raise the pin out of engagement with the hole in the cup-shaped member before the cock can be turned on.

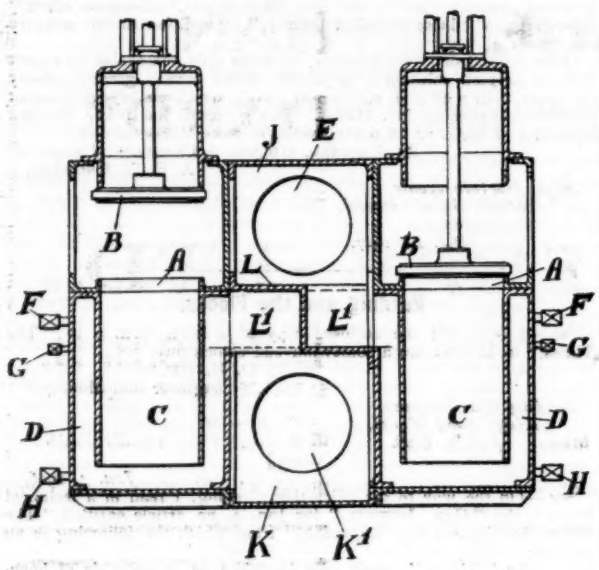
Purifier Valves.—No. 281,001.

DEMPSTER, R., & SONS, LTD., HORSFALL, J. E., and LUMB, H., all of Elland.

No. 20,702; Aug. 23, 1926.

This invention relates to a valve that is primarily intended for purifiers. In a valve arrangement of the usual type, when a valve becomes defective it is necessary to stop the working of the plant; and the present invention has for its chief object to introduce a simple and efficient device whereby any valve can be taken out and replaced while the plant remains in operation.

We reproduce a transverse section showing one form of the invention.



Sealing a Purifier Valve Passage.

An aperture A controlled by a valve B communicates with a tubular passage C which extends into proximity to the bottom of the surrounding vessel D which is closed at the top and arranged in communication with a main inlet pipe E. This vessel is connected at F with a water supply and provided with an overflow pipe G and drain cock H. When it is required to clean or repair the valve, a tap is opened to admit water to the vessel until it flows out through the overflow. The tap is then turned off; and the defective valve can be cleaned or removed and repaired as may be required. When the operation has been completed the drain cock is opened to allow the water seal to drain off.

In applying the invention to a group of valves, each valve, which may be of the disc variety, may be mounted between an upper seating and a lower seating; and each such lower seating may be continued downwardly in the form of a tubular passage C situated within a separate compartment D provided with a water supply pipe F, overflow G, and drain cock H. Two rows of these compartments may be arranged side by side as shown, and spaced apart from one another by an upper chamber J and a lower chamber K; the upper chamber constituting the main inlet, and the lower chamber the main outlet by way of an aperture K¹. These chambers are separated from one another by a deflecting wall L, which may be formed with pockets or recesses L¹ communicating with the aforesaid compartments in any desired manner or order.

Manufacture of Gas.—No. 281,105.

NIELSEN, H., of Muswell Hill, and LAING, B., of Victoria Street, S.W. 1.

No. 32,248; Aug. 25, 1926.

This invention relates to a modification of patent No. 262,834 [see "JOURNAL," Vol. 177, p. 204]. Therein was described a method of manufacturing gas which consists in charging a retort with semi-coke and in passing carbon dioxide or a gas containing carbon dioxide therethrough; either the semi-coke or the gas or both being heated to a temperature between 750° and 850° C. The semi-coke consisted of the solid carbonaceous residue produced by low-temperature distillation at temperatures ranging approximately from 400° to 800° C.

The patentees claim to have discovered, however, that the residue obtained by the internal heating of carbonaceous materials at temperatures ranging up to 1200° C. has higher reactive properties than ordinary high-temperature coke, and is also superior in this respect to the semi-coke produced at lower temperatures in an externally heated retort; and according to the present invention, the residue obtained by internal heating at temperatures ranging up to 1200° C. is also employed for the process described in specification No. 262,834.

In producing the residue which it is now proposed to employ, raw carbonaceous materials are distilled by means of an inert heating gas which is brought into direct contact with the said materials; the process of internal heating being carried on in such a manner that there is no cracking or decomposition of the volatile hydrocarbons yielded up during the process, and, consequently, no deposition of graphitic carbon films on the solid residue. To this end the volatile constituents yielded up are not allowed to pass into hotter zones, and are preferably carried off in uniflow with the heating gases, so that cracking cannot occur. Provided the process of distillation is carried on in this way, the reactive properties of the coke are enhanced, and the process of distillation can be carried on up to 1200° C.

During the process the condensable volatile constituents are first distilled off at temperatures ranging from 400° to 800° C., and thereafter the so-called permanent gases are driven off at temperatures ranging from 800° to 1200° C., thus producing a residue with a volatile content of from 1 to 4 p.ct., and which is suitable for carrying on the process. A suitable method of obtaining the residue is described in greater detail in specification No. 276,407 [see "JOURNAL," Vol. 180, p. 271].

The residue resulting from the reaction by which carbon dioxide is reduced to carbon monoxide consists of ash and mineral matter only.

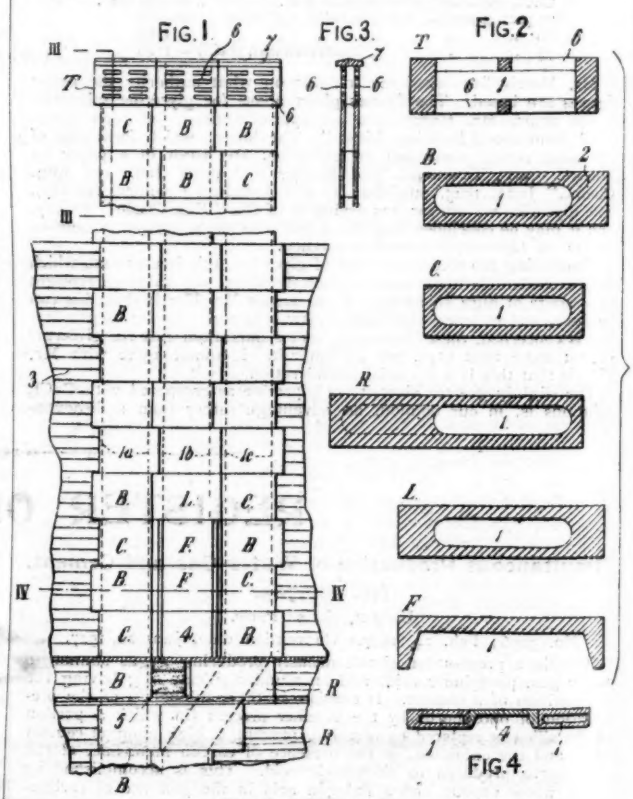
Flue Blocks.—No. 281,392.

CORNELIUS-WHEELER, F., of Bedford Row, W.C. 1.

No. 21,589; Sept. 1, 1926.

The object of this invention is to provide a method and means of constructing gas fire flue ducts from hollow units so that they may be completely bonded with the wall with which they are incorporated.

In accordance with the invention, a flue is constructed from hollow units of story height having castellated sides, or from a set of hollow units arranged in staggered relation, whereby castellated sides are produced, said castellation being of a nature for bonding with the wall of the building in which the flue is made. The units are characterized by the fact that they are made of a cementitious composition including an aggregate of fibrous material mineralized or impregnated by chemical treatment whereby units of minimum width are utilized. Preferably the elements are constructed so that in building, for instance, three flues side by side, the elements will break joint with one another and bond with the wall; and in order to give flexibility to the construction, elements may be used which have their ducts inclined to the horizontal axis, and these are utilized in superimposed position to continue a duct in an oblique direction.



Wheeler's Flue Blocks.

The elements may conveniently have a height equivalent to four ordinary builders' clay bricks; the ends of the four courses being brought flush to meet an element according to the present invention by means of closer bricks as well known in the art.

By utilizing a cementitious composition, as above indicated, the units have the advantage that they may be sawed or cut to desired height. This is of enormous importance in finishing a duct by means of a chimney stack, because the flashing which is required about the stack can be cut so as to pass round it as it would for an ordinary brickwork stack, and, moreover, can, if desired, be screwed or nailed thereto. Moreover, the fact that the stack is built according to the invention assures a much better finish to the stack with regard to

the roof by reason of the accuracy with which the elements may be cut to fit in their different positions with regard to the roof members.

Fig. 1 shows a method of building flues for gas stoves according to the invention; fig. 2 shows in detail plan the set of building elements used; fig. 3 is a sectional elevation on the line III—III of fig. 1; and fig. 4 is a sectional plan of the flue on the line IV—IV of fig. 1.

These drawings suffice to indicate the main lines of the invention; but others are included in the specification, and the patentee describes the various blocks and their uses in detail.

Retort Furnaces.—No. 281,348.

LOW-TEMPERATURE CARBONISATION, LTD., of London Wall Buildings, E.C. 2, and PARKER, C. H., of Codsall.

No. 14,299; June 7, 1926.

According to this invention, in a retort setting of the kind in which a common combustion chamber is disposed beside or between series of vertical retorts in line, and in which transverse walls are provided in the setting between the retorts so as to leave chambers into which the heating gases pass from the common combustion chamber and from which the heating gases pass into contact with the retorts, the transverse walls are provided of checkered brickwork.

The common combustion chamber is advantageously provided of a height corresponding to, or less than, the length of the vertical retorts, and gas and air are admitted at the upper part of the combustion chamber from pipes extending above the setting; gas and air being admitted in adjacent positions into the combustion chamber. Outlet flues from the combustion chamber are provided in the lower part thereof, which outlet flues communicate with the chambers between adjacent retorts; the heating gases thence passing upwardly and through the wall of checkered brickwork directly into contact with the sides of the retort. The gas thence passes downwardly into outlet flues provided adjacent the lower end of each retort in the middle of the setting into the waste-gas flue.

Sulphate of Ammonia Production.—No. 281,474.

COOPER, C., HOLMES, F. B., and W. C. HOLMES & CO., LTD., all of Huddersfield.

No. 30,340; Nov. 30, 1926.

The idea of this invention is to subject gas to a cooling operation, whereby an aqueous condensate containing ammonia and carbon dioxide is produced, and subjecting the cooled gases to the conjoint action of the condensate and calcium sulphate. If found desirable, the condensate may be treated to obtain greater concentration of the ammonia and carbon dioxide. Alternatively, or in addition, the gas may first be cooled to separate a portion of its contained water and ammonia, and the condensate cooled further and used for washing the cooled gas in (say) mechanical washers, and the resultant washing liquid employed in association with calcium sulphate for the further treatment of the gas. The ammonia liquor may be treated to reduce its content of pyridine, tar acids, and cyanogen compounds, the presence of which is undesirable in ammonium sulphate.

The patentees state that, to ensure a further reduction in their ammonia content, the gases may be washed finally with sulphuric acid. This is preferably carried out so that the acid is only partly neutralized; the acid product being used in the treatment of the mixture of ammonia liquor and calcium sulphate employed for extracting ammonia from the gases.

APPLICATIONS FOR PATENTS.

[Extracted from the "Official Journal" for Dec. 31.]

Nos. 35,048—35,487.

BOWATER, N. J.—"Fuel carbonizing plant." No. 35,336.
CHAMBER OVENS, LTD.—See Bowater, N. J. No. 35,336.
JACKSON, E.—"Water boilers." No. 35,341.
LYMN, A. H.—See Bowater, N. J. No. 35,336.

MISCELLANEOUS NEWS.

SERVICE CHARGE CASE IN THE UNITED STATES.

SWEEPING DECISION BY UNITED STATES COURT RULES THAT GAS RATES MUST NOT VIOLATE SOUND ALLOCATION OF COSTS AMONG CUSTOMERS.

[From the American Gas Association Information Service.]

1.—A rate structure which fails to include the element of a service charge is unreasonable as to customers using gas in regular and substantial quantities; and a "flat" or straight-meter rate is for that reason condemned.

2.—A statute prohibiting a service charge or preventing a form of rate based on a service charge, a demand charge, and a commodity charge which would result in a proportional division of the costs among the customers, is arbitrary, confiscatory, and in violation of the constitutional rights of customers and the gas company.

3.—A public service commission will be restrained from enforcing a form of rate which does not properly allocate a part of the cost of service to each customer, so as to include an equitable return by way of compensation to the gas company for like services to each customer.

4.—The right of the class of customers to be served with gas at a reasonable (allocated-cost) rate which does not compel them to pay a large part of the cost of serving other customers, is a property right which may form the basis of suit by one or more customers of that class, and failure to accord such right is confiscation of customers' property without due process of law, and a denial of equal protection of the laws.

5.—A manufacturer who finds himself debarred from using gas for industrial purposes, because of a "flat" or straight-meter rate and a statute which prohibits the commission from allowing a service charge as a part of the rate, is deprived of his property right to be supplied with gas service at a reasonable rate which is not burdened with the cost of serving, at a loss, other customers paying at the same uniform rate; and such a prospective customer may bring suit to enjoin the statute and compel a rate which takes into account a sound allocation of costs.

HISTORY OF THE CASE.

The Niagara Falls Gas and Electric Light Company, of Niagara Falls (N.Y.), had been distributing gas at $2.30 per 1000 c.ft. It reached this high rate only after trying various meter rates from $1.25 upwards.

In 1924 the Company filed with the Public Service Commission of New York three-part rates for domestic and industrial service. The domestic rate contained a commodity charge of only 60c. per 1000 c.ft., a reduction of $1.70; the remainder of the revenue being obtained by means of a fixed charge of about $2 per month. The industrial rate had a much lower charge per 1000 c.ft., with a variable fixed charge dependent upon the maximum hourly speed at which gas was used. These were disapproved by the Commission on the grounds that they contained the elements of service charges, and were therefore contrary to Chapter 898 of the Laws of the State of New York, which forbids service charges by gas companies.

Shortly thereafter, the U.S. Light and Heat Corporation, a concern manufacturing storage batteries, and a prospective gas customer, brought suit against the Company and the Commission, claiming that the failure of the Commission to allow the Company to put into effect the new rates forced it to continue to use oil as a fuel, whereas it could have saved money on the industrial rate which had been filed by the Company. It therefore claimed confiscation, and brought suit in the District Court of the United States for the Western District of New York.

Shortly after the first hearing of the case, a domestic customer, A. M. Hamann, intervened, claiming that his property was even then being confiscated to pay the losses incurred in serving a number of small customers. Mr. Hamann had been paying gas bills of from $10 to $20 per month.

The Gas Company, in its reply, admitted the allegations of both plaintiffs, and further stated that its property was also being confiscated by the "No Service Charge" law, in that by reason thereof it was unable to meet competition and build-up its business.

A number of hearings were held, and testimony was taken of over fifty witnesses from all parts of the country, including the following:

5 members or ex-members of public utility commissions.
7 engineers or ex-engineers of commissions.
12 independent engineers, city officials, &c.
27 public utility officials, representing companies supplying gas to over 3,800,000 customers. This means service to about 20 million people.

These witnesses, from all parts of the country, and presenting a true cross-section of existing conditions, further showed that, where a gas company is operating with a straight-meter rate, a large percentage of the customers do not take enough service, or pay enough money, to reimburse the company for the service which the company renders to all its customers. Those customers that do "pay their way," amounting to about 29 p.ct. of all the customers of all the gas companies, concludes the Master, "usually pay in addition some part of the deficit created by the other two classes."

In presenting his report to the Court, the Special Master sustained broadly the right and power of utility managers to determine the reasonable forms of rates, in the absence of discrimination or excessive return. He recommended, among other things, that Chapter 898 of the Laws of 1923, as follows:

> Service charges prohibited. Every gas corporation shall charge for gas supplied a fair and reasonable price. No such corporation shall make or impose an additional charge or fee for service or for the installation of apparatus or the use of apparatus installed,

be adjudged and decreed illegal and void, because it contravenes the Federal Constitution in that it impairs contractual rights and is arbitrary and confiscatory.

The learned District Court approved and confirmed the Special Master's report, and granted the desired injunction relief, restrain-

ing the Public Service Commission of the State of New York from enforcing a rate which does not fairly allocate a part thereof to each consumer, so as to include an equitable return in compensation to the Gas Company for like services to each consumer; and also to reimburse the Gas Company for its costs and expenses based upon the consumers' demand for service.

THE REPORT OF THE SPECIAL MASTER.

About Aug. 1, 1927, Mr. George P. Keating, Special Master in the case, made his recommendations, which were later approved by the Federal Court. The following extracts from the recommendations are interesting:

> It clearly appears from the testimony that, where a gas company is operating under a meter rate, a large percentage of the company's consumers do not take enough service or pay enough money to reimburse the company for those services which the company renders to all consumers.
>
> It is established that throughout the entire gas industry of this country one class of consumers is paying much more than a reasonable rate or price for the gas service which it receives, due solely to the fact that so large a percentage of consumers pay less than a reasonable price for the services which they receive.
>
> It further appears from the testimony that there is one class of customers benefited by a straight-meter rate. This class is composed of those convenience customers who have no use for gas except as a high-speed convenience, and who as a group use only about 10 p.ct. of the gas. On any straight-meter rate a large percentage of the customers is served at a loss, this loss being made up by other customers of the company. The attempt to collect this loss from the larger customers forces the price of gas beyond competitive cost of other fuels. The straight-meter rate, therefore, results in the curtailment of service to the customers and high average rates. From the community standpoint it is not only discriminatory in that one set of customers benefits at the expense of another, but it is subversive of the general welfare by forcing the use of coal and other fuels, with their resulting smoke, dirt, and annoyance.
>
> The problem before the Court is whether or not a service charge, in whatever disguise it may appear, is a necessary part of a fair rate structure. It seems from the testimony of all the witnesses sworn that a rate structure without the element of a service charge must work inequality upon a large part of the consumers. It seems also that it deprives the gas company of the right to obtain from its customers the cost of the distributed commodity, *plus* a fair return.
>
> It is my opinion that the testimony upon the hearing clearly establishes both that a rate structure from which a service charge is prohibited as such is inequitable as between consumers, and such a rate structure deprives the defendant Gas Company from earning a fair return upon its invested capital and the broad opportunity to serve the public at a fair return. This privilege is secured to it by its corporate charter—a contract with the State itself. The enactment of such a statute is an arbitrary and unnecessary attempt to exercise police power. It impairs the contract between the State and the Company and the right secured to the public by virtue of its provisions.
>
> I therefore recommend that it be adjudged and decreed in this proceeding that Chapter 898 of the Laws of 1923 is illegal and void, because in contravention of Article 1, section 10, sub. 1, of the Federal Constitution, which forbids a State to pass any law impairing the obligation of a contract, and the 14th Amendment, which provides that no State shall deprive any person of life, liberty, or property without due process of law, in so far as it prohibits the defendant, the Niagara Falls Gas and Electric Light Company, from charging or receiving for gas manufactured and sold in the City of Niagara Falls a sum sufficient to pay the costs thereof with a reasonable return upon the investment, and in so far as it prohibits the plaintiff and the intervenor Hamann from purchasing gas from the defendant Niagara Falls Gas and Electric Light Company at a reasonable cost.
>
> Also, that it be adjudged and decreed that the plaintiff intervenor, the defendant the Niagara Falls Gas and Electric Light Company, and the defendant the City of Niagara Falls, be granted a permanent injunction against the defendants the Commissioners of the Public Service Commission (&c.) from making, entering, or imposing any order or requirement that the defendant Gas Company be required to serve and supply gas and gas service under "a rate form which requires the service of a specified or fixed volume of gas for a specified sum, or any other rate form or form of rate which does not equitably allocate (*a*) a part thereof, including an equitable part of a fair return, to each consumer to compensate the defendant Gas Company for those services which are rendered alike to all consumers; (*b*) to compensate the defendant Gas Company for those costs, including an equitable part of a fair return, imposed by each consumer upon the Company according to, and by reason of, his particular demand for service."

GAS REGULATION ACT APPLICATIONS.

DECLARATION OF CALORIFIC VALUE.

REDDITCH GAS COMPANY.—500 B.Th.U., in substitution for 475 B.Th.U. (March 31.)

During the wild gale of Jan. 6, when much damage was done to property in the West Yorkshire district, portions of the ventilator and roof of the retort house at the New Wortley Gas-Works of the Leeds Corporation were blown down. No damage was done to the retorts or to workmen; but it was found necessary to close a portion of the Gelderd Road, lest vehicles or persons should be struck by flying slates.

KNARESBOROUGH GAS UNDERTAKING TRANSFER.

The Knaresborough gas undertaking, which has been bought by the Harrogate Gas Company for £16,000, was formally transferred on Jan. 2 at a luncheon in the Knaresborough Town Hall. Mr. T. D. Hebblethwaite (Chairman of the Knaresborough Urban District Council) presided; and supporting him were Mr. B. Brown (Chairman of the Knaresborough Gas Committee), Alderman F. Barber (Chairman of the Harrogate Gas Company), Mr. J. W. Knowles (Vice-Chairman), Mr. W. A. Bower, Mr. G. Womersley, and Mr. C. A. Barber (Directors), Mr. F. H. Robinson (Engineer and Manager), Mr. A. I Seaton (Secretary), and Mr. H. Wadsworth (formerly Manager of the Knaresborough Gas-Works, who has been appointed Distribution Superintendent to the Harrogate Gas Company).

The price of gas under former ownership was 11d. per therm, with 7½ p.ct. discount. Under the new conditions, the price will be 9d. per therm, with 10 p.ct. discount. The terms of transfer also provide for a considerable improvement in the public lighting of the town.

Mr. B. Brown, proposing "The Harrogate Gas Company and the Gas Industry," said it was 103 years since the streets of Knaresborough were first lighted by gas. He congratulated the Gas Company on their enterprise, and wished them success.

Alderman Barber, replying, said an equitable bargain had been struck. The Company desired to give the most efficient service. Notwithstanding the ill-advised opposition of the Harrogate Corporation, the Board of Trade were so satisfied with the Company's record that they passed the Order without amendment in any material particular. The amalgamation, he believed, would be beneficial to the consumers in both areas. Since the introduction of electricity, the progress of the gas industry had been greater than ever before; and the output of the Harrogate Gas-Works had increased by 56 p.ct. in ten years.

Alderman Barber then handed to Mr. Hebblethwaite cheques amounting to £16,000, and with them a handsome silver salver, as a memento of the transaction.

[A presentation of a canteen of cutlery was made to Mr. Wadsworth by Mr. G. W. Boyes (Clerk to the Council), on behalf of former colleagues and gas-works employees.]

LOW TEMPERATURE CARBONISATION, LTD.

Annual General Meeting.

The Annual General Meeting of the Company was held on Dec. 30—Sir ARTHUR WHEELER, Bt., D.L., J.P., Chairman, presiding.

The CHAIRMAN, in moving the adoption of the report and accounts, said that for all practical purposes the operations of the Company dated from the reconstruction in July, 1926. The present balance-sheet related to the financial details of the reconstruction and the expenditure in connection with the erection and starting-up of new plant. The latter was now working, and giving every satisfaction. The output had reached 70 p.ct. of its total capacity; and the process was for the first time completely successful from both technical and commercial standpoints. "Coalite" was being enthusiastically acclaimed throughout the country as being superior to coal for domestic grates. Coal merchants who were collaborating with them in the distribution of "Coalite" were of opinion that it had come to stay. Local authorities were taking considerable interest in it.

Any colliery which brought to the surface good coking slack could, by working the "Coalite" process, ensure making about 20s. per ton (gross) more for its washed slack than it could obtain to-day. Colliery owners throughout the world were taking great interest in the process. The Company had already reached an agreement with the Askern Colliery, near Doncaster, for the erection at the pithead of a plant capable of dealing with 500 tons a day.

The Company had decided to support a scheme for the manufacture of "Coalite" by a ring of collieries in England and Wales. The product would be marketed by a central sales organization directed by the Company. The capital involved in this new scheme would probably amount to from five to ten million sterling; but it was not anticipated that there would be any difficulty in finding the money. The Company owned the patents covering low-temperature carbonization by the improved Parker process. If any of their future licencees wished to produce pulverized fuel, they would have no difficulty in meeting the demand with the standard plant and process.

DIARIES, CALENDARS, &c.

For 52 years Messrs. John E. Williams & Co., Ltd., of the Victoria Paint Works, Partington, near Manchester, have published a quarterly diary. The first issue for this year is in handy form; and the index at the beginning directs to many matters in which gas men are concerned.

A useful wall calendar comes from the Gas Purification and Chemical Company, Ltd., of Palmerston House, Old Broad Street, E.C. 2.

The locomotives of Messrs. Peckett & Sons, Ltd., of Bristol, are known the world over. Constant reminder will be given of them by the attractive wall calendar which has been received from the firm.

There was great diversity in the quotations which the Belfast Gas Department received in response to advertisements for tenders for the supply, delivery, and erection of forced draught furnaces to steam plant at the chemical department of the gas-works. The tenders included all the best-known makes of furnaces, and the prices varied as much as from £250 to £522. The Manager and Engineer (Mr. J. D. Smith) reported that the lowest priced furnace was quite satisfactory for the purpose required, and recommended the acceptance of the offer of the Chemical Engineering and Wilton's Patent Furnace Company, Ltd., at £250, as being the most advantageous This recommendation was adopted.

COAL TRADE REPORTS.

From Our Own Correspondents.

NORTH-EAST COAST.

There has been considerable activity in shipments during the past week after the quietness of the holiday season; but arrears appear now to have been overtaken, and prospects are not so good. There is, consequently, a rather easier tendency throughout the market. Inquiry for the next few weeks is slow. For longer periods, business matures very slowly, and there is no general improvement in the outlook.

Wear Special gas makes quote 16s. f.o.b., and best qualities are rather easier at 15s. 6d. Seconds quote 13s. 6d. to 14s. Coking is quieter, and quotations are from 13s. 6d. to 13s. 9d. according to quality. Best Durham bunkers are 14s. 6d., and seconds 13s. 6d. to 13s. 9d. Northumberland steams ask 14s. direct for best screened sorts; but demand is slow, and contractors offer at lower prices. Gas coke continues in good demand, and 23s. f.o.b. is asked for shipment.

YORKSHIRE AND LANCASHIRE.

One or two gas coal inquiries are in the market for deliveries to commence in two or three months. With the new scheme before coal-owners, it will be interesting to see what bearing this has on prices for fuel to public utility works.

Some of the better grades of industrial fuel are inclined to harden in value, due, possibly, to fixtures made for deliveries to begin on Jan. 1. It is probable that there is a better tone among manufacturers; but any improvement is spasmodic, and varies according to district.

Stocks of slack at the pit head have decreased by reason of the holidays, and for the moment are firmer for delivery over the next few weeks.

Although there is a slightly better tone among exporters, any improvement in this direction is so gradual as not to be apparent at the moment.

Many collieries have not yet got into proper working order following the extended holidays, and outputs generally are rather below the normal. Throughout the recent colder weather there has been no difficulty in keeping the public supplied with their requirements of domestic coal. This position should continue during the remainder of the winter.

The following are the Humber bunker and export prices, f.o.b. usual shipping ports: South Yorkshire—Hards, Association, 16s. to 16s. 3d.; screened gas coal, 16s. to 17s.; washed trebles, 16s. 6d. to 17s.; washed doubles, 16s. to 16s. 6d.; washed singles, 15s. 9d. to 16s.; washed smalls, 12s. to 12s. 6d.; rough slack, 9s. 9d. to 10s.; smithy peas, 17s. to 18s. 3d. per ton.

West Yorkshire—Hartley's (f.o.b. Goole), 15s. 6d. to 16s. 6d.; screened gas coal, 15s. to 16s.; washed trebles, 16s. 6d. to 17s.; washed doubles, 15s. 9d. to 16s. 3d.; washed singles, 15s. 3d. to 15s. 9d.; washed smalls, 12s. to 12s. 6d.; unwashed trebles, 15s. 9d. to 16s. 3d.; unwashed doubles, 12s. 6d. to 13s. 6d.; rough slack, 10s. to 10s. 6d.; coking smalls, 10s. to 10s. 6d. per ton.

Derbyshire and Nottinghamshire—Top hards, 16s. 3d. to 17s. 6d.; washed doubles, 16s. to 16s. 3d.; washed singles, 15s. 6d. to 15s. 9d.; washed smalls, 12s. to 12s. 6d.; rough slack, 9s. 6d. to 10s. per ton.

Yorkshire, Derbyshire, and Nottinghamshire—Screened steam coal, 15s. to 15s. 6d.; gas coke, 24s. to 25s. 6d.; furnace coke, 18s. to 18s. 6d. per ton.

Business is quiet in Lancashire. Some collieries have tried to advance house coal by 1s. per ton; but there is little disposition to follow this lead. Average quotations are: Lancashire best house coal, 31s. to 32s.; good seconds, 28s. to 30s.; common, 19s. to 21s.; kitchen, 22s. to 24s.; Yorkshire selected house coal, 31s. to 33s.; best house, 26s. to 29s.; cobbles, 18s. to 20s.; washed doubles, 12s. 6d. to 14s.; washed singles, 11s. to 13s.; rough slack, 7s. to 9s. per ton in wagons at pit.

MIDLANDS.

The market remains lethargic. Since the resumption, pits have been working four, and in some cases five, days a week, and the output has been going steadily into consumption, but in no direction is there any sign of strain. Supplies are so plentiful indeed that only in very special cases have collieries been able to put a shilling or so on to the former selling prices of particular grades of house coal, the demand for which has been stimulated by hard weather.

The firm tendency in smalls and slacks is maintained, and that is all. Nuts and beans have been realizing 12s. to 16s. according to size and quality. Good nutty slacks have been fetching 7s. upwards. There is a fairly brisk demand for central heating and industrial purposes. But for steams and other works fuel there is no more pressure than before Christmas. The blast-furnaces have not improved their position. Hard cokes continue to be offered in excess of absorptive capacity. Quotations are round 12s. 6d.

Some coalowners look askance at the scheme for controlling output and prices in the Yorkshire, Derbyshire, and Nottinghamshire area. They do not like to surrender their liberty, particularly those who have sunk a great amount of capital in extensions. They urge that the effect of a scheme of output quotas based on retrospective production will be to deny them the fruits of enterprise which is now reaching reproductivity.

Varying Gas Prices.—It was mentioned in the Enniskillen Urban District Council that, while the price of gas there was 9s. per 1000 c.ft., in the neighbouring town of Strabane it was only 5s. The Clerk was directed to collect statistics from other places regarding the price of gas, cost of coal, freight, &c., with a view to an appeal to the Ministry of Commerce.

"POSITIVE RECORD"

GAS CALORIMETER

(*Simmance's Patent*)

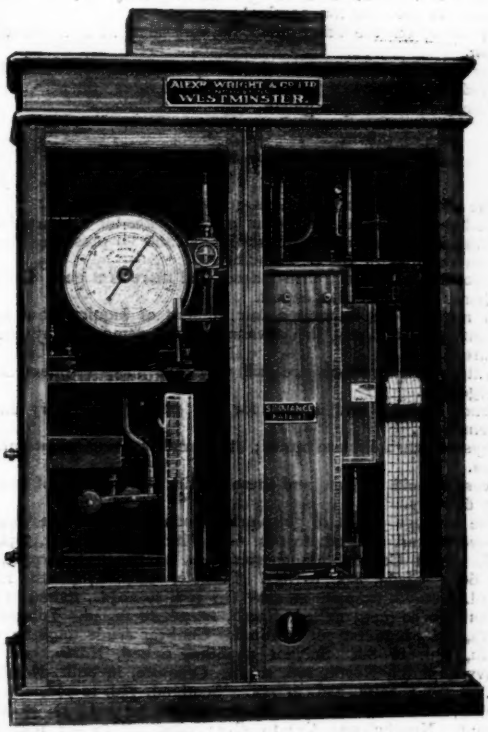
ACCURATE

No Water Troubles.

CERTAIN for a LONG RUN without attention.

A PERFECT TEST INSTRUMENT.
A PERFECT RECORDING MACHINE.
AN AUTOMATIC TESTER.

Maintenance Expense Avoided.



ALEXANDER WRIGHT & CO., Ltd., Westminster, S.W. 1

Telephone: VICTORIA 1207. Telegrams: PRECISION, SOWEST, LONDON.

TRADE NOTES.

"Underjet" Coke Ovens.

Messrs. Simon-Carves, Ltd., of Manchester, have received an order from the Sheffield Coal Company, Ltd., of Sheffield, for a battery of "Underjet" coke ovens, with complete bye-product recovery and treatment plant.

Thomas Potterton (Heating Engineers), Ltd.

The business heretofore carried on under the name of Thomas Potterton by the partners, Messrs. A. B. & T. F. C. Potterton, has been formed into a Private Limited Company, under the same management, with the title of Thomas Potterton (Heating Engineers), Ltd. The firm will continue to specialize in heating and domestic hot water supply equipment and work allied thereto.

"W-D" Continuous Verticals for Valparaiso.

The Woodall-Duckham Vertical Retort and Oven Construction Company (1920), Ltd., have received an order for a continuous vertical retort installation to be built at Valparaiso, South America. The plant is to consist of sixteen 62-in. retorts with a total output of 1½ million c.ft. of gas per 24 hours. The contract includes the erection of a retort house, coal and coke handling plant, and a waste-heat boiler, and was secured in face of severe foreign competition.

CONTRACTS OPEN.

Sulphate of Ammonia Plant.

The Gas Committee of the County Borough of Burnley invite tenders for the supply and erection of a sulphate of ammonia plant. [See advert. on p. 102.]

EXTENSIONS.

Requirements at Aberdeen.

The Gas Committee of the Aberdeen Town Council have considered a report by the Gas Engineer, in which he stated that the demand for gas was still increasing, and that the development of the housing schemes was intensifying the rate of increase. He recommended that an extension of purifiers and scrubbing and washing plant, equal to an increased production of about 3 million c.ft. of gas per 24 hours, should be put in hand, and that additional metering apparatus should also be installed. The probable cost of these extensions would be approximately £25,000. The Committee approved of the report, and agreed to recommend that the Engineer should be authorized to prepare the necessary drawings and to procure and submit tenders for the work.

CURRENT SALES OF GAS PRODUCTS.

The London Market for Tar, Tar Products, and Sulphate.

LONDON, *Jan.* 9.

The tar products market continues quiet.

There is little business being done in pitch; but the price is unchanged at 90s. per ton nominal.

Creosote, on the other hand, is very firm at not below 9d. per gallon.

Pure benzole is 1s. 5d. to 1s. 6d. per gallon; pure toluole, about 1s. 10d. per gallon; 95/160 solvent naphtha, 1s. 3d. per gallon; and pyridine, about 6s. per gallon.

Tar Products in the Provinces.

Jan. 9.

The market for tar products generally remains quiet.

Pitch.—There is no alteration in the market for this article. There is little or no demand from consumers, and no pressure whatever to sell on the part of the manufacturers.

Creosote is still very firm indeed, and there is a good demand both for home trade and for export.

In naphthalene there is a fair amount of inquiry; but buyers at present will not pay the advanced price demanded by the manufacturers.

Water-white products are still very quiet, and business is difficult to negotiate.

Crude carbolic acid is firm for any period of delivery during the present year.

Crystals carbolic are quiet; but makers are maintaining their prices.

Cresylic acid is firm, and there is still a great deal of demand for near delivery.

The average prices of gas-works products during the week were: Gas-works tar, 61s. 6d. to 66s. 6d. Pitch—East Coast, 85s. to 86s. f.o.b. West Coast: Manchester, 80s. to 81s.; Liverpool, 83s. to 83s. 6d.; Clyde, 84s. to 85s. Benzole, 90 p.ct., North, 1s. 1d. to 1s. 2d.; crude, 65 p.ct. at 120° C., 10d. to 10½d., naked at makers' works; 50/90 p.ct., naked, North, 1s. 3d. to 1s. 4d. Toluole, naked, North, 1s. 4d. to 1s. 5d. nominal. Coal-tar crude naphtha, in bulk, North, 7½d. to 8d. Solvent naphtha, naked, North, 9½d. to 10d. Heavy naphtha, North, 10d. to 1s. Creosote, in bulk, North, liquid, 7½d. to 7¾d.; salty, 7¾d. to 7½d.; Scotland, 7½d. to 7¾d. Heavy oils, in bulk, North, 8¾d. to 9¼d. Carbolic acid, 60 p.ct., 2s. 4d. to 2s. 5d. prompt. Napthalene, £13 to £15; salts. £5 to £5 10s., bags included. Anthracene, "A" quality, 2½d. per minimum 40 p.ct., purely nominal; "B" quality, unsaleable.

The electricity supply failed at Spalding on Jan. 2, owing to a breakdown at the Peterborough Works, which supplies the town.

Stockton Reduces Gas Prices.—The Stockton Gas Committee have reduced the price of gas by 2d. per 1000 c.ft., making the charge 3s. 6d.

Bridgnorth Gas Cheaper.—The Bridgnorth Town Council have reduced the price of gas by 6d. per 1000 c.ft., from the December readings of the meter. The new price will be 3s. 6d.

Reduction in Price at Herne Bay.—The Directors of the Herne Bay Gas Company, Ltd., have reduced the price of gas by 0·4d. per therm, making it 12d. per therm, as from the reading of the meters for the Christmas quarter.

Wirksworth Gas Prices.—The Directors of the Wirksworth Gas Light and Coke Company have reduced the price of gas by 0·8d. per therm for lighting, and 1d. per therm for power service. These reductions are equal to 4d. and 5d. per 1000 c.ft. respectively.

Flood Effects at Wivenhoe.—During last week's floods, the River Colne was greatly swollen; and Mr. F. Edwards, who is in charge of the gas-works at Wivenhoe, stated to a Press representative that the flood extinguished fires there. A small gasholder was turned over on to its side by the flood water.

Charges Lower at Houghton-le-Spring.—The Houghton-le-Spring District Gas Company have reduced the price of gas by ½d. per therm, making it 11d., as from the reading of the meters for the Christmas quarter. For prepayment consumers, the rebate returned will be increased from 10d. to 1s. per 1000 c.ft.

Glasgow Gas Department and Appliances.—The Gas Committee of the Glasgow Corporation have agreed to receive a deputation from the Glasgow and West of Scotland Plumbers' and Domestic Engineers' (Employers) Association. It is understood that the Association desire to place before the Committee their views on the operations of the Gas Department with regard to hiring, fitting, and maintaining gas appliances without charging the expenses incurred.

Further Reduction at Crewkerne.—The Directors of the Crewkerne Gas and Coke Company announce a further reduction of 6d. per 1000 c.ft. in the price of gas, from 4s. 9d. to 4s. 3d. (less 3d. discount for prompt payment), as from the Christmas quarter meter readings. The price in 1914 was 3s. 9d. per 1000 c.ft. A special reduction of 6d. is being made to power users, making the price to them 3s. 9d. per 1000 c.ft., or 3s. 6d. less discount, and subject to an annual rebate according to consumption.

New Gasholder at Melbourne.—The Melbourne (Derbyshire) Gas Company have substituted a new three-lift spiral guided holder of a capacity of 55,000 c.ft. in place of a single-lift column guided holder of 19,000 c.ft. capacity. At the inauguration ceremony the Chairman of the Directors (Mr. R. Leake) said that the improvements they had made were such as to ensure an ample and constant supply of gas to the Melbourne district. The Manager, Mr. Kent, said that Melbourne would be well served in the future.

Gas Tragedy at Newtown.—The adjourned inquest on the bodies of the four persons who were found on Sunday evening, Dec. 18, in their respective houses in a state of collapse, and who died subsequently, was held on Wednesday last. Mr. Ernest Nock (Gas Manager) gave evidence of a fracture in the main; and a letter was read from the Board of Trade stating that there was no blame attached to the gas undertaking. The latter, however, suggested that the gas main be lowered to provide a minimum covering of 2 ft. in the locality where the deaths took place. The Jury retired for a considerable time; and when they returned the foreman announced that they had decided that the deaths of three of the people were caused by coal gas poisoning from an escape of gas through a fractured main, and that the fourth death was from heart failure, accelerated by coal gas poisoning.

The Denny and Dunipace Town Council have decided to reduce the price of gas by 5d. per 1000 c.ft., or 1d. per therm, as from this month's meter survey.

On the afternoon of Jan. 6, the electric light failed at Goole. As the current was not resumed until after darkness, a number of workshops in the town had to be closed.

The Bradford Corporation Gas Department have arranged a series of cookery lectures and demonstrations, to be given every afternoon and evening from Monday, Jan. 9, to Saturday, Jan. 14, inclusive, in the large public hall of the Mechanics' Institute. Admission is free. The exhibition was opened on Monday afternoon by the Lord Mayor of Bradford (Alderman M. Conway, J.P.). Miss Gompertz, M.C.A., is the lecturer and demonstrator, assisted by members of the staff of the Gas Department showroom.

The Plymouth Corporation Gas Committee are recommending the Council to apply to the Ministry of Health for sanction to borrow £1500 for the supply and erection of a washer for the extraction of naphthalene at the Devonport Gas-Works. The Committee has decided to enter into an agreement (supplementary to one already in existence) with the Plymouth and Stonehouse Gas Company, under the provisions of the Plymouth Corporation Act, 1915, and the Plymouth and Stonehouse Gas Act, 1916, for the purpose of a supply of gas in bulk to the Company at Pennycross, one of the suburbs of Plymouth, on terms similar to the existing agreement.

On Tuesday afternoon last week an explosion occurred at the gas-works of the Stourbridge Corporation. The retort plant is being extended by a firm of contractors, and it is understood that while riveting was in process a piece of hot iron dropped into a small pit containing a gas valve. There was a slight accumulation of gas in the pit, and an explosion occurred. The force of this caused cracks in the plates of an adjoining purifier, from which the gas escaped and ignited. The Fire Brigade were summoned, and attempts were made to check the flames by sand and by jets of water. The officials and employees at the works succeeded in isolating the purifier, and this helped them in their task of coping with the fire. After an hour's work, the outbreak was quelled. The damage was not serious, and no personal injury was caused.

STOCK MARKET REPORT.

THE activity which prevailed on the Stock Exchange during December was not in evidence when the New Year opened. There was a certain amount of business done in specialities, but the shadow of the approaching account affected the number of transactions. Gilt-edged stocks continued for a time to benefit from the success of the new Treasury Bond issue and by the Bank purchase of gold; but the weakening of the sterling-dollar exchange turned the scale, and prices eased perceptibly. One exception was the 5 p.ct. War Loan, which continued in demand, and at the close of the week improved slightly.

The depreciation in values was not noticeable in the Foreign Market. In spite of the poor traffic returns, Home Rails presented a firm appearance; but the lack of confirmation of the rumoured Metropolitan fusion caused the "bulls" to offer that Company's stock freely, and the price naturally drooped.

The Industrial Market was more animated, but, as indicated, business was mostly confined to specialities. Iron and Steel shares showed signs of revival; but Rubbers and Oils continued to be depressed.

As might be expected at this time of the year, the Gas Market was rather subdued; only forced sales were taking place. The market is awaiting with interest the announcements of the various companies for the past year, the first of which is usually that of the Gas Light and Coke Company, which is expected in about a week's time. The prominence given lately in the financial Press to the Oriental Company's stock has resulted in a further rise of 3 points to 108-113.

The following transactions were recorded during the week:

On Tuesday, Bombay 22s., British 5 p.ct. debenture 96, European 7⅞, Gas Light and Coke 93½, 94, 94½, 94⅛, 94⅞, 95, 3½ p.ct. maximum 63½, 4 p.ct. preference 77, 3 p.ct. debenture 60⅝, Imperial Continental 145, 146, Primitiva 20s., 20s. 3d., 20s. 4½d., 20s. 6d., 20s. 7½d., 20s. 9d., 20s. 10½d., 21s., 21s. 1½d., South Metropolitan 103, 103¼, 103⅜, Southampton 5 p.ct. 77½, Swansea 6½ p.ct. debenture 100, 101. Supplementary prices, Guildford 96½, 97, Newport (Mon.) 5 p.ct. maximum 77, 77½, Swansea 5 p.ct. maximum 80, 81.

On Wednesday, Aldershot 4 p.ct. preference 70½, Gas Light and Coke 94½, 94⅛, 95, 4 p.ct. preference 78, 78½, Montevideo 92, Primitiva 20s. 6d., 20s. 10½d., 21s., 21s. 1½d., 21s. 3d., 21s. 4½d., 21s. 6d., South Metropolitan 103, 103½, 103⅜, 103¾, 104, Southampton 5 p.ct. maximum 78, 78½. Supplementary prices, Folkestone 77.

On Thursday, Aldershot 4 p.ct. preference 70, Alliance and Dublin 4 p.ct. debenture 65, British 5 p.ct. debenture 95⅛, Commercial 3 p.ct. debenture 57, European 7⅞, Gas Light and Coke 94½, 94⅜, 94⅛, 94⅝, 94⅜, 95, 3 p.ct. debenture 59⅜, 59½, Oriental 109½, Primitiva 20s. 6d., 20s. 7½d., 20s. 9d., 20s. 10½d., 21s., 21s. 1½d., 21s. 2½d., South Metropolitan 103¼, 104¼, 3 p.ct. debenture 60, 60½, 6¼ p.ct. debenture 103½, South Suburban 5 p.ct. debenture 94⅛, Wandsworth, Epsom 5 p.ct. 112½. Supplementary prices, Southend 5 p.ct. new 85, 86.

On Friday, Barnet 7 p.ct. maximum 106½, 107½, British 112, 112½, European 7⅞, Gas Light and Coke, 94½, 94⅜, 94⅛, 94⅝, 3 p.ct. debenture 59⅞, Imperial Continental 145½, Primitiva 20s. 7½d., 20s. 9d., 20s. 10½d., 21s., Tuscan 6 p.ct. debenture 65.

The prospects regarding money are considered satisfactory, though no immediate reduction in the Bank Rate is anticipated. Short credits continued in abundant supply. Fresh accommodation was obtainable at 2½ p.ct.; but old day-to-day loans were renewed at from 3 p.ct. to 3½ p.ct. The discount market was less active, but rates were slightly easier on the decline in the Treasury Bill rate, which averaged £4 5s. 0·87d. p.ct., or about 3½d. p.ct. below the previous week's rate.

The feature of the Foreign Exchange Market was the late weakness in the American Exchange, which closed ⅛c. lower at 4.87⅞. Several Continental gold exchanges moved sharply in favour of sterling, particularly German marks, which rose 1½ pf. to 20.47½. The Brussels rate advanced to 34.94½, and the Berne rate ⅛c. to 25.29. Italian lire finished at 92.24½; French francs were steady at 124; and Pesetas closed with a rise of 0.11 to 28.28.

Silver was rather dull, and the cash price cheapened to 26⅝d. per oz. Gold remained at the nominal price of 84s. 11½d. per oz.

The Bank Rate is 4½ p.ct., to which it was reduced from 5 p.ct. on April 21. Bankers' deposit rates are 2½ p.ct. The deposit rates of the discount houses are 2½ p.ct. at call and 2⅝ p.ct. at notice.

Issue.	Share.	When ex-Dividend.	Dividends. Prev. Hf.Yr	Dividends. Last Hf. Yr.	NAME.	Quotations. Jan. 6.	Rise or Fall on Week.	Transactions Lowest and Highest Prices.
£			%p.a	% p.a.				
171,978	Stk.	Sept 8	5	5	Aldershot 5 p.c. max. C. .	68—73	..	..
329,992	,,	,,	4	4	Do. 4 p.c. Pref. . .	69—72	..	70—70½
1,551,868	,,	Sept. 29	7	7	Alliance & Dublin Ord. .	90—94	..	..
374,000	,,	July 14	4	4	Do. 4 p.c. Deb. . .	64—67	..	65
522,654	,,	Aug. 25	—	7	Barnet Ord. 7 p.c. . . .	105—108	..	106½—107½
300,000	1	Oct. 13	1/7½	1/7½	Bombay, Ltd.	21/6—23/6	..	22/-
170,000	10	Aug. 25	8½	8½	Bournemouth 5 p.c. . . .	12½—13½	..	..
600,050	10	,,	7	7	Do. B 7 p.c. . . .	12—12½	..	..
275,000	10	,,	6	6	Do. Pref. 6 p.c. .	10½—11½	..	..
50,000	Stk.	June 29	3	3	Do. 3 p.c. Deb. .	55—58	..	..
162,025	,,	,,	4	4	Do. 4 p.c. Deb. .	75—78	..	..
357,900	,,	Aug. 25	—	7½	Brighton & Hove 6 p.c. Con.	103—111	..	..
341,800	,,	,,	—	6/8/6⅔	Do. 5 p.c. Con.	98—101	..	..
1,287,500	,,	July 28	6	6	Bristol 5 p.c. max. . . .	87—88a	..	..
855,000	,,	Sept 29	7	8	British Ord.	110—113	..	112—112½
100,000	,,	Dec. 22	7	7	Do. 7 p.c. Pref. . . .	114—117*	..	..
120,000	,,	,,	4	4	Do. 4 p.c. Red. Deb. .	72—75*	..	..
200,000	,,	,,	—	33/2	Do. 5 p.c. Red. Deb. .	98—96*	..	95½—96
100,000	10	Nov. 24	8	6	Cape Town, Ltd. . . .	7—8	..	..
100,000	10	Oct 27	4½	4½	Do. 4½ p.c. Pref. . .	6—7	..	..
150,000	Stk.	Dec. 22	4½	4½	Do. 4½ p.c. Deb. . .	70—75*	..	..
626,860	,,	July 28	6	6	Cardiff Con. Ord. . . .	100—103	..	..
237,860	,,	June 29	7½	7½	Do. 7½ p.c. Red. Deb. .	103—106	..	..
157,150	,,	Aug. 11	6½	5	Chester 5 p.c. Ord. . . .	87—92b	..	..
79,185	1	Oct. 13	1/2/-	1/2/-	Colombo Ltd. Ord. . . .	31/—33/-	..	..
24,495	1	,,	1/4½	1/4½	Do. 7 p.c. Pref. . .	20/—22/-	..	..
321,490	1	Oct. 13	1/9⅜	1/9⅜	Colonial Gas Assn. Ld. Ord.	24/—26/-	..	..
178,900	1	,,	1/7½	1/7½	Do. 8 p.c. Pref.	20/—22/-	..	..
2,073,280	Stk.	July 14	—	5	Commercial Ord.	93—95	..	..
475,000	,,	Dec. 22	8	8	Do 8 p.c. Deb. . .	55—58*	..	57
300,000	,,	Sept. 29	‡1	11	Continental Union, Ltd. .	28—33	..	..
100,000	,,	,,	7	7	Do. 7 p.c. Pref. . .	87—92	..	..
787,560	,,	Aug. 11	6½	6½	Croydon sliding scale . .	98—101	..	..
403,100	,,	,,	5	5	Do. max. div.	81—84	..	..
492,270	,,	Aug. 25	9	6	Derby Con.	103—105e	..	..
55,000	,,	Dec. 22	4	4	Do. Deb.	71—73e*	—2	..
209,000	,,	Aug. 25	5	5	East Hull Ord. 5 p.c. . .	78—81	..	..
50,000	,,	Dec. 22	5	5	Eastbourne 5 p.c. Deb. .	90—95*	..	..
1,002,180	10	Sept. 29	‡3	‡4	European, Ltd.	7⅞—8½	..	7⅞—7⅞
6,747,460	Stk.	July 28	5	5	Gas Light & Coke 4 p.c. Ord.	93½—95½	+½	93½—95
2,600,000	,,	,,	3½	3½	Do. 3½ p.c. max. . .	62—64	..	63½
4,167,020	,,	,,	4	4	Do. 4 p.c. Con. Pref. .	76—79	..	77—78½
5,602,620	,,	Dec. 22	3	3	Do. 3 p.c. Con. Deb. .	59—61*	..	59½—60½
181,315	,,	,,	6	6	Do. 6 p.c. Be'st'd Rd. Db.	100—103*	..	..
1,642,770	,,	,,	5	5	Do. 5 p.c. Red. Deb. .	98—100*	..	..
42,000	,,	—	7½	7½	Do. 7½ p.c. Ilford Deb. .	..	..	..
82,500	,,	Aug. 25	6½	6½	Hastings & St L. 5 p.c. Conv	89—92	..	..
258,740	,,	,,	5½	5½	Do. 3½ p.c. Conv.	70—73	..	..
70,000	10	Oct. 13	‡10	‡10	Hongkong & China, Ltd. .	12—13	..	..
173,200	Stk.	Aug. 25	5	5	Hornsey Con. 3½ p.c. . .	75—78	..	..
1,976,000	,,	Nov. 10	10	10	Imperial Continental Gas.	144—147	+1	145—146
223,130	,,	Aug. 11	3½	3½	Do. 3½ p.c. Red. Deb.	68—70	..	..
285,242	,,	Aug. 11	6½	7	Lea Bridge 5 p.c. Ord. . .	96—99	..	..
2,145,907	,,	Aug. 11	5½	5½	Liverpool 5 p.c. Ord. . .	88—89b	..	..
600,000	,,	Sept 29	7	7	Do. 7 p.c. Red. Pref.	103—105b	..	..
165,786	,,	Aug. 25	8	9	Maidstone 5 p.c. Cap. . .	107—112	..	..
75,000	5	Dec. 22	‡7	‡8	Malta & Mediterranean .	5½—5⅝*	..	..
541,920	Stk.	Nov. 24	‡7	‡5	Montevideo, Ltd. . . .	90½—92½	+½	92
2,061,315	,,	July 28	5	5	Newcastle & Gateshead Con.	79½—79⅝d	+1⅛	..
360,929	,,	,,	4	4	Do. 4 p.c. Pref. .	67½—67⅝d	..	..
691,705	,,	June 29	3½	3½	Do. 3½ p.c. Deb. .	66½—67⅛d	..	..
131,785	,,	Aug. 25	—	6/18/0	North Middlesex 6 p.c. Con.	93—96	..	..
800,000	,,	Nov. 24	7	9	Oriental, Ltd.	103—113	+3	109½
188,120	,,	Dec. 22	7½	7½	Plym'th & Ston'house 5 p.c.	102—107*	..	..
414,500	,,	Aug. 25	7½	7½	Portsm'th Con. Stk. 4p.c. Std.	102—105	..	..
236,732	,,	,,	5	5	Do. 5 p.c. max.	76—79	..	..
2,289,909	1	—	—	—	Primitiva Ord.	20,6—21/6	+1/6	20/—21/6
282,200	100	Dec. 1	4	4	Do. 4 p.c. Red. Deb. .	90—93	..	..
600,000	Stk.	July 28	4	4	Do. 4 p.c. Red. Deb. 1911	75—77	..	..
434,968	,,	Dec. 22	4	4	Do. 4 p.c. Cons. Deb. . .	74—76*	..	..
150,000	10	Sept. 29	6	6	San Paulo 6 p.c. Pref. . .	81—83	..	..
125,000	50	Jan. 3	5	5	Do. 5 p.c. Red. Deb.	46—48*	—1	..
270,000	Stk.	Sept. 8	5½	5½	Sheffield A	102—104e	..	..
419,968	,,	,,	5½	5½	Do. B	102—104e	..	..
1,047,000	,,	,,	5½	5½	Do. C	102—104e	..	..
90,000	10	May 26	4	6	South African	4—6	..	..
3,603,895	Stk.	Aug. 11	7	5	South Met. Ord.	103—105	+1	103—104½
500,000	,,	—	—	—	Do. 6 p.c. Irred. Pf.	110—113	..	..
1,895,445	,,	July 14	3	3	Do. 3 p.c. Deb. . .	59—62	..	60—60½
734,000	,,	Sept. 8	6½	6½	Do. 6½ p.c. Red. Db.	102—104	..	..
97,500	,,	Aug. 11	8½	8½	South Shields Con. . . .	101—103d	..	103¼
1,242,795	,,	July 28	6½	6½	South Suburban Ord. 5 p.c.	102—105	..	..
388,837	,,	Dec. 22	5	5	Do. 5 p.c. Deb.	92—95*	..	94⅜
847,740	,,	Sept. 8	5	5	South'mpton Ord. 5 p.c. max	76—79	+1	77½—78½
121,275	,,	Dec. 22	4	4	Do. 4 p.c. Deb.	72—75*	..	..
350,000	,,	Aug. 25	7	7	Swansea 7 p.c. Red. Pref. .	103—106	..	..
200,000	,,	Dec. 22	6½	6½	Do. 6½ p.c. Red. Deb.	99—102*	..	100—101
120,000	,,	July 28	7½	7½	Tottenham District A 5 p.c.	107—110	..	..
882,275	,,	,,	6½	6½	Do. B 5½ p.c.	91—94	..	..
170,000	,,	,,	5½	5½	Do. 5½ p.c. Pref.	97—100	..	..
181,255	,,	Dec. 8	4	4	Do. 4 p.c. Deb.	74—77	..	..
238,251	,,	Sept. 29	5	5	Tynemouth Con. and New	81—83d	..	..
239,094	,,	Aug. 25	6½	6½	Uxbridge, Maidenhead, & Wycombe 5 p.c. . . .	85—90	..	..
98,330	,,	,,	5	5	Do. 5 p.c. pref. .	88—88	..	..
30,000	,,	July 14	8½	8½	Wandsworth, Wimbledon, and Epsom— Wandsworth A 5 p.c. .	127—132	..	..
385,686	,,	,,	7	7	Do. B 3½ p.c. .	107—112	..	..
473,585	,,	,,	5/19/0	5/19/0	Do. C and New	94—99	..	..
862,000	,,	,,	6⅞	6⅞	Do. Wimbledon 5 p.c. .	102—107	..	..
28,000	,,	,,	7½	7½	Do. Epsom 5 p.c. . .	110—115	..	112½
250,000	,,	,,	5	5	Do. 5 p.c. Pref . . .	87—92	..	..
95,416	,,	Dec. 22	3	3	Do. 3 p.c. Deb. . . .	56—59*	..	..
234,743	,,	,,	4	4	Do. 4 p.c. Deb. . . .	73—76*	..	..

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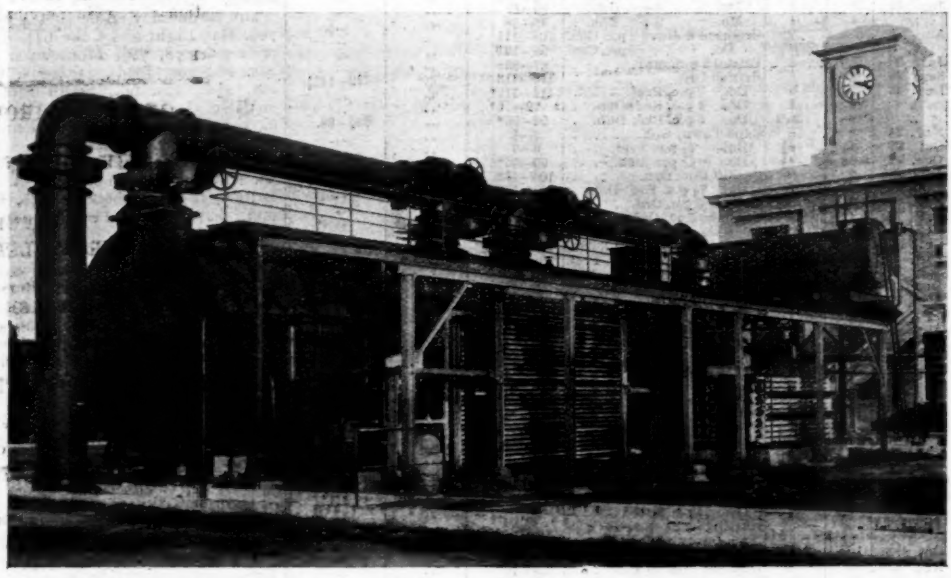

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